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ABSTRACT

Three workshops were held in 1977 in central Pennsylvania to provide a coordinated effort to improve and expand the knowledge of health occupations teachers on the secondary and postsecondary levels. Each workshop provided five days of concentrated learning activities in one of the following areas: methods of instruction for health occupations teachers, evaluation in health occupation education, and dental-assisting activities for health occupations teachers. The participant preservice and inservice teachers attended sessions designed to provide them with up-to-date information on health occupations education; with continuity of effort in Pennsylvania health occupations programs; with methods for improving instruction and developing, designing, and evaluating courses; with guidelines for new and emerging clinical experience activities; and with the background to meet certification requirements. Based on surveys of the demographic characteristics and workshop evaluations of the participants, it was found that: (1) while a majority had experience in nursing, few had experience in other fields of health occupations education; (2) a majority held teaching certificates and usually were certified to teach more than two subject areas; (3) a majority planned to implement or had already used information gained at the workshops; and (4) generally the workshops were worthwhile, open, and effective. Future inservice activities of this type were recommended. (ELG)

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THE
PENNSYLVANIA
STATE
UNIVERSITY
DEPARTMENT
OF
VOCATIONAL
EDUCATION

FINAL REPORT

COORDINATED IN-SERVICE ACTIVITIES
FOR HEALTH OCCUPATIONS TEACHERS
IN CENTRAL PENNSYLVANIA

F. MARVIN HOLE
AND
DEBRA CAROL BYRD-BREDBENNER

Pennsylvania Department of Education
Bureau of Vocational Education
Project No. 512-05 (8994)



U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
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VOCATIONAL — TECHNICAL EDUCATION Research Report

June 1978

Health Occupations, Monograph Number 8

Volume 16, Number 2
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COORDINATED IN-SERVICE ACTIVITIES FOR HEALTH
OCCUPATIONS TEACHERS IN CENTRAL PENNSYLVANIA

(Project No. 61049-3)

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(June, 1978)

ACKNOWLEDGEMENTS

The authors extend sincere appreciation to the Pennsylvania Bureau of Vocational Education and the Division of Occupational and Vocational Studies of The Pennsylvania State University for their assistance.

Special appreciation is extended to the visiting specialists who participated in the workshops.

The Centre County Area Vocational-Technical School is also thanked for permitting their facilities to be used in conducting the Dental Assisting activities for Health assistant teachers workshop.

Thanks is also extended to Sharon Aurand and Nancy Karschner who typed the monograph.

ABSTRACT

61049-3: Coordinated In-Service Activities for Health Occupations Teachers in Central Pennsylvania.

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Purpose

The purpose of this project was to provide a coordinated effort to improve and expand the knowledge of health occupations teachers in Central Pennsylvania.

These workshops are a continuing effort to provide leadership and instructional improvement to a major vocational area that has had less than adequate direction and help from vocational teacher education institutions. The topics that the three workshops dealt with were:

1. Methods of instruction for health occupations teachers.
2. Evaluation in health occupations education.
3. Dental assisting activities for health occupations teachers.

Objectives

1. To provide up-to-date information relevant to health occupations education.
2. To provide continuity of effort in health occupations programs in Central Pennsylvania.
3. To strengthen health occupations programs in Central Pennsylvania by providing leadership in course design for new and emerging health occupational activities.

4. To provide teachers with in-service techniques for improving their teaching effectiveness.
5. To provide a means for pre-service and in-service health occupations teachers meet certification requirements.

Outcomes

The objectives of this project were accomplished through three summer workshops in health occupations education. These workshops focused on:

1. Dental assisting activities for health assistant teachers.
2. Improvement of instruction for health occupations.
3. Evaluation in health occupations education.

Audiences

The workshop provided instruction to health occupations teachers in Central Pennsylvania.

Publications and Available Material

- o Final Report

CHAPTER I

BACKGROUND OF THE PROJECT

Introduction

Health occupations education programs are diverse and scattered throughout Pennsylvania. Due to the lack of organized programs in health occupations teacher education, there are no natural centers where health occupations teachers can meet for common instruction. The development of new techniques and the discovery of new knowledge creates a need for health occupations teachers to pursue advanced degrees and seek teacher certification. Accurate, up-to-date information for the health occupations educator is necessary so that continuity and improved instruction may result.

In order to fully understand the vast importance associated with having in-service health occupations programs for teachers, it can be fully recognized when the philosophies of vocational education and health occupations education are examined.

Basic Philosophy of Vocational Education

The primary function of the educational program in any community is to develop the individual citizen's capacities so that he or she is a good member of the community and of the larger democracy.

Vocational education, as an integral part of the total education program of a community, makes a contribution toward the development of good citizens, including their health, social, civic, cultural and economic interests. It is not a subject that might be included in a program of education, but is a broad field of education. Its chief

purpose is to fit individuals for gainful employment through the development of skills, knowledge, understandings, attitudes, work habits and appreciations.

Basic Philosophy of Health Occupations Education

Health occupations education is a phase of vocational education that provides instruction and experience for the purpose of preparing persons for gainful employment.

1. To provide instruction of a preparatory type in the development of basic manipulative skills, communication skills, safety judgment, technical knowledge and related medical information.
2. To provide instruction of an extension or supplement type for the further development and upgrading of performance skills, technical knowledge, related medical information, safety and job judgment for persons already employed in the health field.

Health occupations education is provided under several general programs. These programs will benefit students in high school; those who have dropped out of school and are unemployed; those who have completed high school but seek specialized training; those who suffer from cultural and economic handicaps; employed adults who want to upgrade their skills and technical knowledge; and people of all ages who learn new skills to earn their living.

Students in health occupations education need to develop skills in the cognitive, affective and psychomotor domains. There are several general objectives, as stated in the various health occupations instruction guides:

1. Possess the necessary knowledge, attitudes and skills to meet the criteria for postsecondary health occupations education.
2. Have the option of seeking employment as an entry level worker in the health occupations.
3. Understand, apply and transfer related specific and academic knowledge to actual technical procedures and situation.
4. Demonstrate selected skills in performing technical procedures basic to a variety of health occupations technologies.
5. Have had experiences and information helpful in making a viable career choice.
6. Practice acceptable professional ethics.
7. Demonstrate knowledge of legal implications related to the work.
8. Practice empathy and tolerance and demonstrate an understanding of people.
9. Demonstrate leadership skills.
10. Demonstrate knowledge and understanding of the basic principles or functions underlying procedures for patient care.
11. Be motivated to increase his or her knowledge and competencies as a worker in health occupations.
12. Be aware of their own self-concept and recognize the interactions of people.
13. Be aware of the opportunities for flexibility and creativity in health occupations.
14. Understand basic business and office procedures so that she will be able to function adequately in record keeping, office management and communication including good public relations.

15. Observe safety regulations for the protection of himself or herself; co-workers and patients.
16. Establish and maintain satisfactory relationships with patients and other medical personnel.
17. Practice good habits of personal health care and grooming.
18. Demonstrate good work habits.

Need for the Study

Health occupations teachers are working toward advanced degrees and certification in many institutions in Pennsylvania. Thus, there is a need to provide a means for bringing health occupations teachers together to discuss methods of strengthening and providing a common direction in health occupations education instruction. An organized program of advanced study for health occupations teachers is needed. Also, there is a need to provide an organized program of advanced study for health occupations teachers. There is a need to provide for improvement of instruction in the various health occupations programs and to provide common directions in each. There is also a need to provide leadership in the establishment of evaluative criteria with regard to health occupations programs, students and teaching methods. In addition, the provision of guidelines for new and emerging clinical experience activities are needed.

CHAPTER II

WORKSHOPS

The University Park campus of The Pennsylvania State University was utilized for two of the workshops. The Centre County Area Vocational-Technical School was utilized for the dental assisting workshop as it required the utilization of a dental assistant laboratory area.

The workshops were conducted during July and August, 1977, and each provided five days of concentrated learning activities plus completion of a project during the three week period following each workshop.

The target population of this project was almost 100 percent women. Nearly all of the students attending the various health occupations programs in Pennsylvania are girls and a large number are educationally disadvantaged.

Workshop Contents

The topics dealt with in the workshops were selected in conjunction with a needs survey of health occupations teachers educators.

The lack of organized programs in health occupations teacher education contributes to the lack of natural centers for such educators to meet for common instruction. The workshop provided a common meeting ground for health occupations teacher educators to discuss ways of strengthening health occupations and to attend a program of advanced

study designed specifically for them. The workshops also aided in providing methods for the improvement of instruction as well as providing leadership in developing, designing, and evaluating courses as well as guidelines for new and emerging clinical experience activities. The workshops aimed at providing up-to-date information and provided continuity of effort in Central Pennsylvania health occupations programs. In addition, the workshops provided pre-service and in-service health occupations teachers with techniques for improving their teaching effectiveness.

Dental Assisting Activities for Health Assistant Teachers

This workshop was held for dental assistant teachers on August 1-5, 1977. The workshop was held at the Centre County Area Vocational-Technical School.

A dental assistant is a person trained to assist the licensed dentist in private offices, group practice, dental clinics or federal agencies. Today the dental assistant's primary function is to assist the dentist at chairside. A recent regulation of the State Dental Council and Examining Board has increased the scope of the procedures that the assistant may perform under the direct supervision of the dentist. Certain laboratory duties may also be performed, and in some offices the assistant may work as a receptionist and secretary.

The purpose of instruction is intended for secondary vocational students who may be:

1. Securing employment as a worker in the field of dental health.
2. Interested in dental assisting as the result of previous experiences in a course for health assistants.

3. Pursuing a career in the field of dental health on a post-secondary level.

This course is intended to give the student an opportunity to:

1. Acquire knowledge and necessary skills and acceptable attitudes for the safe and competent performance of duties as a dental assistant.
2. Become aware of the several options available and to assist in choosing a specific career within the field of dental health.

Basic Philosophy of Dental Assistant's Education

The dental assistant course is a segment of health occupations education designed for students in the senior year of high school, or for the junior and senior years of high school (the postsecondary course is a full-time program). It will introduce the student to dental health occupations and to the responsibilities of those who are employed in them. This should be a democratic process and should be based upon those principles of science and business which will enable the student to function adequately and safely as an entry worker in the field of dental health. It should provide opportunities for growth as an individual and as a citizen. This course will provide adequate learning experiences for acquiring knowledge and developing those skills and attitudes which will enable effective performance at the assistant level.

This workshop was set up in order for teachers to be able to effectively carry out a dental assisting program.

The workshop was divided into major segments providing the

participants with information in three ways; through lecture and demonstration in the form of accurate, up-dated presentations, through group activities and through question and answer periods.

The agenda for the five-day workshop follows on the next pages.

Dental Assisting Activities for Health Assistant Teachers

The workshop dealt with dental assisting activities and was specifically designed for health assistant teachers. The goal of this workshop was to analyze techniques and improve instruction in the dental assisting and health programs.

Workshop participants were exposed to numerous learning experiences. First, the philosophical, historical and organizational aspects of dental assisting were presented thus providing the basis for the workshop.

The first day of instruction focused on the dental team and its function as well as the duties that the health assistant may perform and the laws governing these duties. The morning session introduced comprehensive dental anatomy including bones of the skull and face, permanent and deciduous dentition, and tooth anatomy. Morphology and the charting of common conditions found in the oral cavity were covered during the afternoon session. The afternoon group and individual activity focused on dental cements and restorative materials.

Dental Instrumentation and Burs was the topic covered the second workshop day. Students participated in instrumentation identification, dental tray set-ups, instrument transfer in four handed dentistry activities and oral evacuate. A lecture and demonstration on dental

HEALTH OCCUPATIONS TEACHER EDUCATION WORKSHOP
 I.Ed. 498Gv
 (Dental Assisting Activities for Health Assistant Teachers)
 August 1-5, 1977
 2 Credits
 The Pennsylvania State University
 Division of Occupational and Vocational Studies
 University Park, Pennsylvania

Program Director: Dr. F. Marvin Hole

Resource Specialist: Mrs. Deborah Jane Psota

P R O G R A M

Monday, August 1, 1977

8:00 (AM)	Registration
9:00	Philosophy, History and Organization of Dental Assisting
10:00	The Dental Team and How it Functions
11:00	Basic Dental Anatomy - Bones of the Skull and the Face - Permanent and Deciduous Dentition - Parts of the Teeth
	Group Activity
1:00 (PM)	Surfaces of the Teeth - Morphology
2:00	Charting Methods, Common Conditions Found in the Oral Cavity
3:30	Group Activity: (Dental Cements and Restorative Materials)

Tuesday, August 2, 1977

9:00 (AM)	Lecture and Demonstration on Dental Materials - Matrix
11:00	Dental Instruments and Burs
1:00 (PM)	Group Activity: Tray Set-Ups - Four Handed Dentistry - Instrument Transfer - Oral Evacuate
3:50	Question Period

Wednesday, August 3, 1977

- 9:00 (AM) Radiology in Dentistry - Hazards of Dental X-Rays - Legal Limitations in Dental Radiology
- 10:00 How to Expose Dental X-Rays Using 2 Techniques:
"Bisecting Angle"
"Parallel"
- 1:00 (PM) Group Activity:
--practice position X-rays with partners
--practice instrument transfer, four handed dentistry
--practice charting exercise
--practice oral evacuate
--practice tray set-ups
--practice matrix set-ups
- 3:50 Question Period

Thursday, August 4, 1977

- 9:00 (AM) Radiology in Dentistry -
How to take Bite Wing X-Rays
How to Develop Periapical and B.W. Dental X-Rays
How to Mount Full Mouth Series
- 11:00 Group Activity:
Positioning B.W. X-Rays - Exposing X-Rays - Develop Exposed X-Rays - Mount Full Mouth Series
- 1:00 (PM) Gypsum Products -
How to Work With Dental Plaster and Stone
How to Pour Models
- 2:00 Group Activity:
Will practice those procedures and techniques covered to date

Friday, August 5, 1977

- 9:00 (AM) Patient Education in:
PREVENTIVE DENTISTRY and HOME CARE
- 11:50 Importance of Restorative Dentistry and Specialities

Friday, August 5, 1977 (CONTINUED)

1:00 (PM)	Summary Group Activities
3:15	Question and Answer Period Evaluation

materials--matrix was also presented.

Radiology in dentistry was selected as the third topic. Students were made aware of hazards and legal limitations in dental radiology. Safety and teamwork of the health team in radiology was emphasized.

Exposing dental X-rays using the techniques of "bisecting angle" and "parallel" were also included. Afternoon activities aimed at practicing such skills as:

- positioning for X-ray with partners
- transferring instruments in four handed dentistry
- exercise in charting
- practicing oral evacuate
- practicing tray set-ups
- practicing matrix set-ups

The third session closed with a question and answer period.

The theories of taking periapical dental X-rays and bite wing X-rays were covered on the fourth day of the workshop. Students also received instruction on how to develop periapical and bite wing dental X-rays. How to mount full mouth series X-rays was included in the dental radiology lecture. Morning group activities focussed on positioning and exposing bite wing X-rays using a dummy block as the patient. The students then developed the exposed X-rays and mounted the full mouth series. Discussion focused on radiographic pitfalls and how to overcome them.

The afternoon session dealt with gypsum products. Students were shown how to work with dental plaster and stone and how to pour models. The afternoon group activity allowed students to practice

with gypsum products as well as to practice any skills learned earlier in the week.

The final meeting of this workshop emphasized patient education in preventative dentistry and home care. The importance of restorative dentistry and specialties were also included during the final session.

Students were given the opportunity to practice those skills covered in the workshop during the afternoon. The workshop concluded with an open discussion and a question and answer period.

Methods of Instruction For Health Occupations Teachers

This workshop was held for health occupations teachers on August 15-19, 1977. The University Park Campus of The Pennsylvania State University was utilized as the workshop meeting site.

This course was designed to deliver pre-service and in-service educational needs to health occupations teachers. The Pennsylvania Department of Education through and in cooperation with the Division of Occupational and Vocational Studies, The Pennsylvania State University is in the process of improving and upgrading both teachers and curricular offerings in health occupations education. This course was part of the plan for the upgrading.

The instructional program in Industrial Education is approved by the Pennsylvania Department of Education to prepare and recommend health occupations education teachers from secondary through post-secondary education levels. The proposed course is intended to fulfill divisional responsibility to the Commonwealth of Pennsylvania by focusing its participants' attention and energies upon the improvement of health occupations education-curriculums. The proposed course is

addressed to both undergraduate and graduate students. Present divisional course offerings build to and support a course which would acknowledge the special circumstances of health occupations education teachers.

Through class participation and the successful completion of activities designed for this course the student will:

- A. Examine selected research devoted to learning and teaching.
- B. Identify essential characteristics, problems and concerns of the health occupations learner.
- C. Differentiate appropriate methods, techniques and devices for teaching the health occupations learner.
- D. Develop and evaluate through an analysis of related research, instructional programs for the health occupations learners in a specific program.

Workshop Activities For Health Occupations Teachers

The workshop provided the health occupations teachers with a variety of learning experiences. The goal of this workhhop was to analyze techniques and improve instruction in the health occupations programs.

The first day of instruction focused on the instructional process. The learning process of the average student, as well as the special needs student, was reviewed. The participants received instruction in writing performance objectives that were precise and included the method of evaluation within the objective.

Another presentation provided the participant with an orientation

to vocational education and an understanding of the role of the Department of Education in vocational education. Late afternoon sessions focused on the roles and responsibilities of the health occupations education teachers both legally and ethically.

Participants also received instruction and methods for selecting meaningful clinical learning experiences. Such learning experiences should be relevant and reinforce the lecture material if it is to be of the greatest value to students.

The second day of the workshop provided the student with an historical and philosophical background of vocational education and has health occupations share this very same background.

The four step teaching method was presented on the second day of the workshop. Lesson plan design and preparation activities stressed the importance of knowing in advance what is to be done during the classroom instruction period, as well as what is to be accomplished through the particular lesson. Evaluation of lesson plans aided workshop members in grasping the importance of knowing how and when activities are to be carried out and to provide meaningful learning experiences for the students.

On the third day of the workshop the group was divided into two smaller groups. Group I received instruction on the instructor's role in laboratory organization and management. During this time, group II practiced micro teaching.

Group I then received instruction on laboratory safety. Again, group II practiced micro teaching. The two groups switched activities during the afternoon session so that all participants were involved in each activity.

Instructional media and materials were covered on the fourth day. Participants were encouraged to carefully evaluate all media on the basis of: applicability and suitability to their particular situation, workmanship, cost, and necessity.

During the afternoon session, the participants were again divided into two groups. Group I practiced micro teaching while group II received instruction on individualized instruction and evaluation.

The instruction received an evaluation emphasized that students' performance, attitudes and characteristics must all be considered when deriving grades.

The morning activities of the last day of the workshop were the same as the previous afternoon's agenda. However, the two groups reversed their activities. Activities that vocational students can become involved in and benefit from were discussed. The value of these activities is that they often aid students in choosing a specific vocation or occupation, thus enabling them to gain more in-depth training while in the vocational technical program. The need for vocational teacher certification in addition to requirements necessary to obtain such certification credentials was discussed. The workshop concluded with a discussion evaluating and summarizing the workshop's subject matter and teaching strategies.

Evaluation in Health Occupations Education

This workshop was held at The Pennsylvania State University on July 25-29, 1977. The workshop was designed to give participants instruction on the selection and utilization of appropriate evaluation techniques in the classroom and clinical setting. The only prerequisite

METHODS OF INSTRUCTION FOR HEALTH OCCUPATIONS TEACHERS

I Ed 498Hv - 2 Credits

The Pennsylvania State University
 Division of Occupational and Vocational Studies
 119 Rackley Building
 University Park, PA 16802

ProgramMonday August 15, 1977

8:00 - 8:45 a.m.	Registration--Keller Conference Center
8:45 - 9:15 a.m.	Room 106 Sackett
	Welcome and Introduction of Workshop Staff Dr. F. Marvin Hole
9:15 - 10:30 a.m.	Room 124 Sackett
	"The Role of the Department of Education in Vocational Education" Kenneth A. Swatt, Section Chief, Development Services, Bureau of Vocational Education, Pennsylvania Department of Education
10:10 - 10:30 a.m.	Break
10:30 - 12:00 noon	Room 124 Sackett
	"Writing Performance Objectives" Dr. Frank W. Adelman
12:00 - 1:00 p.m.	Lunch
1:00 - 1:45 p.m.	Room 106 Sackett
	"The Learner and Learning" Dr. F. Marvin Hole
1:45 - 2:15 p.m.	Room 106 Sackett
	"The Learner with Special Needs" Dr. F. Marvin Hole
2:15 - 2:30 p.m.	Break
2:30 - 3:15 p.m.	Orientation to Vocational Education, Rm. 106 Sackett Dr. F. Marvin Hole
3:15 - 4:00 p.m.	Room 106 Sackett
	"The Role of Responsibilities of the Health Occupations Education Teacher" Dr. F. Marvin Hole
4:00 - 5:00 p.m.	Room 106 Sackett
	"Selecting Clinical Learning Experiences" Dr. F. Marvin Hole

METHODS OF INSTRUCTION FOR HEALTH OCCUPATIONS TEACHERS
I Ed 498Hv - 2 Credits

Tuesday August 16, 1977

8:30 - 10:00 a.m. Room 124 Sackett
"Teaching - The Four Step Method"
Dr. Frank W. Adelman

10:00 - 10:30 a.m. Break

10:30 - 12:00 noon Room 124 Sackett
"History and Philosophy of Vocational Education"
Miss A. Louise Harding, Senior Program
Specialist, Health Occupations Education,
Bureau of Vocational Education, Pennsylvania
Department of Education

12:00 - 1:00 p.m. Lunch

1:00 - 2:30 p.m. Room 106 Sackett
"Designing Lesson Plans"
Dr. Frank W. Adelman

2:30 - 3:00 p.m. Break

3:00 - 4:30 p.m. Room 106 Sackett
"Lesson Plan Preparation"
Dr. Frank W. Adelman

Wednesday August 17, 1977

8:30 - 10:00 a.m. Room 106 Sackett
Group I - "The Instructor's Role in Laboratory
Organization and Management"
Mr. Harry Kraft, Assistant Professor
Division of Occupational and Vocational
Studies, The Pennsylvania State University
Room 124 Sackett
Group II - "Micro Teaching"

10:00 - 10:30 a.m. Break

10:30 - 12:00 noon Room 106 Sackett
Group I - "Laboratory Safety"
Dr. Ray Wahl, Professor, Division of
Occupational and Vocational Studies, The
Pennsylvania State University
Room 124 Sackett
Group II - "Micro Teaching"

12:00 - 1:00 p.m. Lunch

METHODS OF INSTRUCTION FOR HEALTH OCCUPATIONS TEACHERS
I Ed 498Hv - 2 Credits

1:00 - 2:30 p.m. Room 124 Sackett
Group I - "Micro Teaching"
Room 106 Sackett
Group II - "The Instructor's Role in
Laboratory Organization and Management"
Mr. Harry Kraft

2:30 - 3:00 p.m. Break

3:00 - 4:30 p.m. Room 124 Sackett
Group I - "Micro Teaching"
Room 106 Sackett
Group II - "Laboratory Safety"
Dr. Ray Wahl

Thursday August 18, 1977

8:30 - 10:00 a.m. Room 106 Sackett
"Instructional Media and Materials"
Mr. Gerald Funk, Project Associate
Division of Occupational and Vocational
Studies, The Pennsylvania State University

10:00 - 10:30 a.m. Break

10:30 - 12:00 noon Room 106 Sackett
"Instructional Media and Materials"
Mr. Gerald Funk

12:00 - 1:00 p.m. Lunch

1:00 - 2:30 p.m. Room 124 Sackett
Group I - "Micro Teaching"
Room 106 Sackett
Group II - "Individualizing Instruction"
Mr. Stephen Hill, Research Associate,
Division of Occupational and Vocational
Studies, The Pennsylvania State University

2:30 - 3:00 p.m. Break

3:00 - 4:30 p.m. Room 124 Sackett
Group I - "Micro Teaching"
Room 106 Sackett
Group II - Evaluation
Dr. F. Marvin Hole

METHODS OF INSTRUCTION FOR HEALTH OCCUPATIONS TEACHERS
I Ed 498Hv - 2 Credits

Friday August 19, 1977

8:30 - 10:00 a.m.	Room 124 Sackett <u>Group I</u> - "Micro Teaching" Room 106 Sackett <u>Group II</u> - "Individualizing Instruction" Mr. Stephen Hill
10:00 - 10:30 a.m.	Break
10:30 - 12:00 noon	Room 124 Sackett <u>Group I</u> - "Micro Teaching" Room 106 Sackett <u>Group II</u> - "Evaluation" Dr. F. Marvin Hole
12:00 - 1:00 p.m.	Lunch
1:00 - 2:00 p.m.	Room 106 Sackett "Vocational Student Activities" Mr. John Vincent, Project Coordinator, Division of Occupational and Vocational Studies, The Pennsylvania State University
2:00 - 2:30 p.m.	Break
2:30 - 3:00 p.m.	Room 124 Sackett "Certification" Dr. S. T. Brantner, Associate Professor Division of Occupational and Vocational Studies, The Pennsylvania State University
3:00 - 4:00 p.m.	Room 106 Sackett Evaluation and Summary Dr. F. Marvin Hole

was that the participant must be an in-service or pre-service health occupations teacher or administrator.

The Pennsylvania Department of Education through and in cooperation with the Division of Occupational and Vocational Studies, The Pennsylvania State University is in the process of improving and upgrading both teachers and curricular offerings in the adult vocational areas. This workshop was designed to be part of the plan for the upgrading.

Through class participation and successful completion of activities designed for this course, the student will:

- A. Examine and evaluate research devoted to evaluation.
- B. Identify and examine specific evaluation processes related to health occupations education.
- C. Identify and examine specific evaluation processes related to the clinical setting.
- D. Develop through an analysis of related research and its application to a specific program, a plan for evaluation of students or programs.

The first topic covered in this workshop was Instructional Accountability. Participants received instruction on evaluation versus accountability and the relationship of behavioral objectives to accountability. The influence of behavioral objectives on the teaching-learning process and on the evaluation process was also discussed.

The development of behavioral objectives was the second major topic covered in this workshop. The components of specific and general behavioral objectives were reviewed. The participants were given points and tips for writing behavioral objectives.

The third major concept dealt with preassessment. Workshop

participants discussed preassessment of both entry behavior and terminal behavior. Instruments used for preassessment were examined. This topic concluded with participants receiving instruction on how and what specific instructional activities to prescribe for students exhibiting difficulties on preassessments of behavior.

The next concept dealt with objectives and the behavioral domain. All three domains, cognitive, affective and psychomotor, were analyzed. This analysis examined the use, practicality, testability of objectives and how to write behavioral objectives that will reflect the domain intended.

Several types of evaluation procedures were presented. The uses, reliability and practicality of norm-referenced and criterion-referenced evaluation, were reviewed. Participants received instruction on ways of implementing a criterion-referenced evaluation system into their classroom. The evaluation concept was concluded with a discussion focusing on the differences between the grading and the evaluating process.

The group then examined methods of evaluating attainment of behavioral objectives. Such methods as paper and pencil tests, problem solving evaluation and group projects were covered.

The final topic dealt with methods of evaluating attainment of clinical behavioral objectives. First, it is important to review the meaning of clinical practice in order to make the discussion understandable to all participants. The methods of evaluation discussed were observation methods, written communication methods and oral communication methods.

A. Heading in Catalog(s)

Designation: I.Ed.

Number: 498Fv

Title: Evaluation in Health Occupations Education

Credits: 2 2 0

Description: The selection and utilization of appropriate evaluation techniques in the classroom and clinical setting.

Prerequisite: Inservice or preservice health occupations teacher or administrator.

B. Outline of Course Content

1. Instructional accountability

- a. Evaluation vs accountability
- b. Relationship of behavioral objectives to accountability
- c. Influence of behavioral objectives on the teaching-learning process
- d. Influence of behavioral objectives on the evaluation process.

2. Development of behavioral objectives

- a. Components of a behavioral objective
- b. Specific behavioral objectives
- c. General behavioral objectives
- d. Points in writing behavioral objectives.

3. Preassessment

- a. Preassessment of entry behavior
- b. Preassessment of terminal behavior
- c. Prescribing specific instructional activities.

4. Objectives and the behavioral domain

- a. Cognitive
- b. Affective
- c. Psychomotor.

5. Evaluation

- a. Norm-referenced
- b. Criterion-referenced
- c. Implementing a criterion-referenced evaluation system
- d. Differences between the grading and the evaluation process.

6. Methods of evaluating attainment of behavioral objectives
 - a. Paper and pencil test items
 - b. Problem solving evaluation
 - c. Group projects.
7. Methods of evaluating attainment of clinical behavioral objectives
 - a. Meaning of clinical practice
 - b. Observation methods
 - c. Written communication methods
 - d. Oral communication methods.
8. Students will complete an individual project analyzing research and its application to a specific program during the two weeks following the workshop group sessions.

C. 1. Course Objectives

- A. Through class participation and successful completion of activities designed for this course the student will
 - a. Examine and evaluate research devoted to evaluation
 - b. Identify and examine specific evaluation processes related to health occupations education
 - c. Identify and examine specific evaluation processes related to the clinical setting
 - d. Develop through an analysis of related research and its application to a specific program, a plan for evaluation of students or program.
- B. Achievement of these objectives will be determined through each students'
 - a. Regular participation in class and class-related activities
 - b. Completion of short instructional modules on selected aspects of evaluation
 - c. Attainment of adequate scores on two or more evaluative measures
 - d. Development in detail of selected evaluation methods for a specific program.

CHAPTER III

FINDINGS

The demographic characteristics of the workshop participants and the workshop evaluation results are presented in this chapter. Individual responses were tallied and are presented in table form.

Subject Certification

Table 3.1 summarizes the subjected participants of each of the three workshops were certified to teach. A majority of the teachers were certified to teach two or more subjects.

Occupational Experience

Table 3.2 summarizes the findings concerning the occupational experience of workshop participants. An overwhelming majority of the participants had occupational experience in nursing.

Years of Experience

Table 3.3 summarizes the total number of years of experience participants had accumulated. Nursing was the occupational experience in which participants had the most experience. A vast number of years of experience was evidenced in this field. Some participants did not indicate how many years of experience they had accumulated, therefore, it was not possible to summarize this information for the table.

Average Number of Years of Experience

Table 3.4 illustrates the average number of years of experience participants in the workshop had. Overall, the nursing occupation had the highest average number of years of experience. When the number of

TABLE 3.1

SUBJECT CERTIFICATION OF TEACHERS PARTICIPATING IN
HEALTH OCCUPATIONS EDUCATION WORKSHOPS

	<u>Dental Assisting Workshop</u>	<u>Evaluation in Health Occupa- tions Education Workshop</u>	<u>Methods of Health Occupa- tions Education Workshop</u>
Health Assistant	2	3	3
Nurses Aide/ Practical Nurse	2	2	4
Dental Assistant	3	1	0
School Nurse	1	1	1
Health Occupations	1	2	0
Medical Assistant	0	2	0
Cooperative Education	0	2	2
Special Needs/ Research	1	0	0
Other	0	2	1

TABLE 3.2

YEARS OF OCCUPATIONAL EXPERIENCE
OF WORKSHOP PARTICIPANTS

	<u>Dental Assisting Workshop</u>	<u>Evaluation in Health Occupa- tions Education Workshop</u>	<u>Methods of Health Occupa- tions Education Workshop</u>
Nursing	5	5	6
Medical Lab Technician	0	0	1
Dental Assistant	1	1	0
Adult Education	0	1	0
Special Needs/ Research	1	1	1
Other	0	2	0

years experience was not specified by participants, averages could not be computed.

Range of Number of Years of Experience

Table 3.5 presents the range of number of years of experience of participants the workshops. The Evaluation of Health Occupations Education Workshop had the widest range of years of experience with years ranging from 7 to 10.

Participant Evaluation of Workshops

The purpose of the questionnaire was to determine when the workshop participants were going to implement information gained from the workshops into their classroom, as well as evaluate the workshops themselves. The results of the evaluations will be used to further improve future workshops.

Data were collected using a structured questionnaire as well as open-ended questions. The instrument developed for this study included three sections: (a) information concerning when participants would implement workshop materials into their classroom, (b) evaluation of the workshops, and (c) information concerning improvements for future workshops.

The data were collected by mailing the questionnaires to each workshop participant. Participants were requested to return the completed questionnaire in the self-addressed, stamped envelope which accompanied the questionnaire. Replies were anonymous.

Dental Assisting Workshop

Seven questionnaires were mailed and six (86%) were returned. The

TABLE 3.3

TOTAL YEARS OF EXPERIENCE OF PARTICIPANTS IN WORKSHOP

	<u>Dental Assisting Workshop</u>	<u>Evaluation in Health Occupa- tions Education Workshop</u>	<u>Methods of Health Occupa- tions Education Workshop</u>
Nursing	65.5	71	94
Medical Lab Technician	0	0	25
Dental Assistant	2.5	2	0
Adult Education	0	5	0
Special Needs/ Research	*	*	*
Other	0	17	0

* Number of years of experience not specified.

TABLE 3.4

AVERAGE NUMBER OF YEARS OF EXPERIENCE
OF PARTICIPANTS IN WORKSHOP

	<u>Dental Assisting Workshop</u>	<u>Evaluation in Health Occupa- tions Education Workshop</u>	<u>Methods of Health Occupa- tions Education Workshop</u>
Nursing	13.10	14.20	15.66
Medical Lab/ Technician	0	0	25
Dental Assistant	2.5	2	0
Adult Education	0	5	0
Other	0	8.5	0

TABLE 3.5

RANGE OF NUMBER OF YEARS OF EXPERIENCE
OF PARTICIPANTS IN WORKSHOP

	<u>Dental Assisting Workshop</u>	<u>Evaluation in Health Occupa- tions Education Workshop</u>	<u>Methods of Health Occupa- tions Education Workshop</u>
Nursing	4-20+	7-30	6-25+
Medical Lab Technician	0	0	25*
Dental Assistant	2.5*	2*	0
Adult Education	0	5*	0
Other	0	5-12	0

* Only one person in this category, therefore no range could be derived.

findings are presented as follows: implementation of information gained workshop, evaluation of the workshop and suggestions for improving the workshop.

Implementation of Information Gained in the Workshop

Table 3.6 summarizes when the workshop participants plan to implement knowledge gained at the workshop into their classrooms. An overwhelming majority of the teachers implemented the information immediately or would implement the information later in the school year or within the next school year. None of the teachers replied that they could foresee no immediate use for the information. Only two topics taking bite wing X-rays and exposing X-rays were marked by one person, to never be implemented into her classroom.

The results indicated that the participants felt all the information covered in the workshop was pertinent and they planned to implement it into their curriculum.

Workshop Evaluation

Presented in the following section are the findings of the evaluation of the Dental Assisting Workshop based on the responses of the workshop participants to the survey questionnaire.

Question #1

Overall, the workshop was:	#	%
Very worthwhile in terms of answering my immediate needs.	6	100
A worthwhile experience, though some of my immediate needs were not met.	0	0
Of limited value.	0	0
Comments: _____		

TABLE 3.6

IMPLEMENTATION OF DENTAL ASSISTING WORKSHOP INFORMATION INTO THE CLASSROOM

Presentation	<u>Immediately at the beginning of the school year</u>		<u>Later on in the school year</u>		<u>Within the next school year</u>		<u>At some future date, though I can foresee no immediate use for them</u>		<u>Never</u>	
	%	#	%	#	%	#	%	#	%	#
Philosophy, History & Organization of Dental Assisting	50	3	50	3	0	0	0	0	0	0
The Dental Team and How it Functions	33	2	66	4	0	0	0	0	0	0
Basic Dental Anatomy										
a. Bones of the Skull and face	33	2	66	4	0	0	0	0	0	0
b. Permanent and Deciduous Dentition	17	1	84	5	0	0	0	0	0	0
c. Parts of the Teeth	17	1	84	5	0	0	0	0	0	0
Surfaces of the Teeth - Morphology	17	1	66	4	17	1	0	0	0	0
Charting Methods, Common Conditions Found in the Oral Cavity	17	1	66	4	17	1	0	0	0	0
Activity:										
a. Dental Cements	84	5	17	1	0	0	0	0	0	0
b. Restorative Materials	84	5	17	1	0	0	0	0	0	0

TABLE 3.6
(Continued)

Presentation	<u>Immediately at the beginning of the school year</u>		<u>Later on in the school year</u>		<u>Within the next school year</u>		<u>At some future date, though I can foresee no immediate use for them</u>		<u>Never</u>	
	%	#	%	#	%	#	%	#	%	#
Dental Materials - Matrix										
a. Lecture	0	0	84	5	17	1	0	0	0	0
b. Demonstration	0	0	84	5	17	1	0	0	0	0
Dental Instruments and Burs	0	0	84	5	17	1	0	0	0	0
Activity:										
a. Tray Set-Ups	0	0	84	5	17	1	0	0	0	0
b. Four Handed Dentistry	0	0	84	5	17	1	0	0	0	0
c. Instrument Transfer	0	0	84	5	17	1	0	0	0	0
d. Oral Evacuate	0	0	84	5	17	1	0	0	0	0
Radiology of Dentistry										
a. Hazards of Dental X-Rays	0	0	66	4	17	1	0	0	0	0
b. Legal Limitations in Dental Radiology	0	0	66	4	17	1	0	0	0	0
How to expose Dental X-Rays	0	0	66	4	17	1	0	0	0	0
a. Bisecting Angle	0	0	66	4	17	1	0	0	0	0
b. Parallel	0	0	66	4	17	1	0	0	0	0
Activity:										
a. Position X-Rays with Partner	0	0	66	4	17	1	0	0	0	0
b. Charting Exercise	0	0	100	6	0	0	0	0	0	0
c. Oral Evacuate	0	0	84	5	17	1	0	0	0	0
d. Tray Set-Ups	0	0	84	5	17	1	0	0	0	0
e. Matrix Set-Ups	0	0	84	5	17	1	0	0	0	0

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TABLE 3.6
(Continued)

Presentation	<u>Immediately at the beginning of the school year</u>		<u>Later on in the school year</u>		<u>Within the next school year</u>		<u>At some future date, though I can foresee no immediate use for them</u>		<u>Never</u>	
	%	#	%	#	%	#	%	#	%	#
Radiology in Dentistry										
a. Taking Bite Wing X-Rays	17	1	50	3	17	1	0	0	17	1
b. Developing Penapical and Bite Wing Dental X-Rays	33	2	50	3	17	1	0	0	0	0
c. Mounting Full Mouth Series	33	2	50	3	17	1	0	0	0	0
Activity:										
a. Positioning Bite Wing X-Rays	33	2	50	3	17	1	0	0	0	0
b. Exposing X-Rays	33	2	33	2	17	1	0	0	17	1
c. Develop Exposed X-Rays	33	2	50	3	17	1	0	0	0	0
Gypsum Products										
a. Working with Dental Plaster and Stone	33	2	66	4	0	0	0	0	0	0
b. Pouring Models	0	0	50	3	17	1	0	0	0	0
Patient Education										
a. Preventive Dentistry	50	3	50	3	0	0	0	0	0	0
b. Home Care	50	3	50	3	0	0	0	0	0	0
Importance of Restorative Dentistry and Specialities	33	2	50	3	17	1	0	0	0	0

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The participants all (100%) agreed that the workshop proved to be very worthwhile in terms of meeting their immediate needs. One participant commented that she needed or could have used more on dental X-raying and charting.

Question #2

The amount of time spent on lecture:	#	%
Was too extensive.	0	0
Was about right for the material presented.	6	100
Was inadequate for the kind of materials presented.	0	0
Could better have been spent on other activities.	0	0

Comments: _____

The participants unanimously (100%) agreed that the time spent lecturing was about right for the material presented. No comments were made.

Question #3

Small group meetings:	#	%
Were effectively incorporated into the workshop.	5	84
Should have been included, but were not.	0	0
Were not necessary and were not included.	1	17

Added nothing to workshop effectiveness and should have been omitted.

Comments: _____

An overwhelming majority (84%) felt that small group meetings were effectively incorporated into the program. Two participants commented that the class was a small group which was a very good size for effective learning.

Question #4

Audiovisual presentations:	#	%
Were used with great effectiveness.	1	17
Were not as effectively used as they might have been.	2	33
Were not used, but would have been helpful.	3	50
Were not necessary for this workshop and were not used.	0	0
Were relied upon too heavily.	0	0

Comments: _____

Participants had varied opinions concerning the use of audiovisuals. Fifty percent of the participants felt that the use of audiovisual aids would have been helpful, while thirty-three percent felt the audiovisuals were not as effectively used as they might have been. Two participants commented that audiovisual presentations would have been beneficial.

Question #5

Opportunity for discussion:	#	%
Was adequate and greatly helped the group's understanding of topics presented.	6	100
Was limited, but adequate for purposes.	0	0
Was inadequate.	0	0

Comments: _____

All participants (100%) felt that the opportunity for discussion was adequate and that the discussions helped a great deal in understanding the topics presented. No comments were included.

Question #6

On the whole, this workshop was:	#	%
More effective than others I've attended.	3	50
Similar to others of its type I've attended.	0	0
Not as effective as others.	0	0
This is the first workshop of this type I've attended.	3	50

Comments: _____

Half (50%) of the participants had never attended a workshop of this type and the other half (50%) felt this workshop was more effective than others they had attended. A participant commented that the workshop helped her feel more secure by giving her some basic knowledge to go into a first teaching experience.

Question #7

As a participant, I felt:	#	%
Very welcome to ask questions or seek additional help at any time.	6	100
Welcome to ask questions when they were asked for.	0	0
Somewhat uneasy about asking questions.	0	0

Comments: _____

One-hundred percent of the participants felt very welcome to ask questions or seek additional help. No comments were made.

Question #8

I intend to implement methods or material introduced in this workshop.	#	%
Immediately.	3	50

Question #8 (Continued)

	#	%
Within the next year.	3	50
At some future date, though I can foresee no immediate use for them.	0	0
Never.	0	0
Comments: _____		

All participants (100%) intended to implement information introduced in this workshop immediately or within the next year. One participant indicated she would not be able to implement methods on materials gained until the dental equipment for her school arrived, however, she expected it within the next year.

Methods of Instruction for Health Occupations Teachers Workshop

Eight questionnaires were sent out and seven (88%) were responded to and returned. The findings are presented as follows: implementation of information gained in the workshops, evaluation of the workshop, and suggestions for improvement.

Implementation of Information Gained in the Workshop

Table 3.7 illustrates, when the workshop participants planned to implement knowledge received at the workshop into their classroom. An overwhelming majority planned to implement the information within the next year, later on this year or had implemented it immediately at the start of this school year. One respondent could foresee no immediate use for some of the concepts or the respondent felt they would never use some of them.

On the whole, the majority of the respondents could foresee using or already had used the information gained at this workshop.

TABLE 3.7

IMPLEMENTATION OF METHODS OF INSTRUCTION FOR HEALTH OCCUPATIONS
TEACHERS WORKSHOP INFORMATION INTO THE CLASSROOM

<u>Presentation</u>	<u>Immediately at the beginning of the school year</u>		<u>Later on in the school year</u>		<u>Within the next school year</u>		<u>At some future date, though I can foresee no immediate use for them</u>		<u>Never</u>	
	%	#	%	#	%	#	%	#	%	#
Writing Performance										
Objectives	43	3	14	1	43	3	0	0	0	0
The Learner and Learning	29	2	43	3	29	2	0	0	0	0
The Learner with Special Needs	57	4	0	0	14	1	14	1	0	0
The Role and Responsibilities of the Health Occupations Education Teacher	29	2	57	4	0	0			0	0
Selecting Clinical Learning Experiences	0	0	14	1	43	3	14	1	0	0
Teaching - The Four Step Method	57	4	0	0	43	3	0	0	0	0
History and Philosophy of Vocational Education	29	2	0	0	29	2	14	1	14	1
Designing Lesson Plans	43	3	14	1	29	2	0	0	0	0
Lesson Plan Preparation	43	3	29	2	14	1	0	0	0	0
The Instructor's Role in Laboratory Organization and Management	43	3	14	1	29	2	0	0	14	1
Micro Teaching	57	4	0	0	43	3	0	0	0	0
Laboratory Safety	43	3	0	0	29	2	0	0	14	1

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TABLE 3.7
(Continued)

<u>Presentation</u>	<u>Immediately at the beginning of the school year</u>		<u>Later on in the school year</u>		<u>Within the next school year</u>		<u>At some future date, though I can foresee no immediate use for them</u>		<u>Never</u>	
	%	#	%	#	%	#	%	#	%	#
Instructional Media and Materials	43	3	29	2	14	1	0	0	0	0
Individualized Instruction	43	3	14	1	43	3	0	0	0	0
Evaluation	43	3	43	3	14	1	0	0	0	0
Vocational Student Activities	0	0	43	3	14	1	0	0	14	1
Certification	29	2	0	0	14	1	14	1	14	1

Information Concerning Improvements For Future Workshops

The following section presents the questions asked in order to seek ways to improve future workshops. Each question is followed by a brief summary of the comments the participants made.

1. What part of the program was of most value to you as a health occupations educator?

In answer to this question several responses were made. Two participants felt that they needed to learn manipulative dental skills or have hands on experience. Another participant found the techniques of instruction to be of the most value while another found the entire workshop to be valuable. One participant felt that the X-rays and impression-pouring molds were of particular value as she felt these concepts would have been the most difficult to learn about through reading alone. It was felt that these concepts were presented concisely and practicing them was a great help. This participant also found charting exercises to be valuable.

2. What part of the program was of least value to you?

One participant responded that she found the charting and parts of the theory of little value because of previous learning. Another participant thought the history of dentistry to be of little value. Two participants found everything valuable and necessary since all of the information would be covered in this year's program.

3. What topics would you like offered at the next workshop?

Participants responded that they would like the next workshop to offer such topics as: legal aspects and management of outside school learning experiences, clerical aspects of a health assistant, more depth of theory and practice, dental instrumentation, radiology, dental

assisting activities and more on four-handed dentistry with time to practice under supervision.

4. What would you consider the single most important concept gained from this workshop?

The concepts that were found to be the most important to the workshop members included: the importance of preventative dentistry, career opportunities for dental assistants, dental X-raying, and learning the basic manipulative skills that apply to dental assisting.

5. Please describe your overall reaction to the workshop. (Was it what you expected, useful, suggestions for improvement!)

The participants found the workshop to be either more than they had expected or was very much what they had expected. They found the workshop to be very useful, informative, and of much value to all health educators.

Two participants suggested that a second part of the workshop be included so that health teachers could increase their skills.

Workshop Evaluation

Presented in the following section are the findings of the evaluation of the methods of instruction for health occupations teachers workshop based on the responses of the workshop participants to the survey questionnaire.

Question #1

Overall, the workshop was:	#	%
Very worthwhile in terms of answering my immediate needs.	4	57
A worthwhile experience, though some of my immediate needs were not met.	1	14

Question #1 (Continued)

	#	%
Of limited value.	2	29

Comments: _____

Fifty-seven percent of the participants found the workshop to be very worthwhile. One participant commented that the workshop was not pertinent enough to practical nursing and another stated he/she had already covered most of the material presented in previous vocational courses.

Question #2

The amount of time spent on lecture:	#	%
Was too extensive.	0	0
Was about right for the material presented.	7	100
Was inadequate for the kind of materials presented.	0	0
Could better have been spent on other activities.	0	0

Comments: _____

Participants unanimously (100%) agreed that the amount of time spent on lecture was about right for the material presented. No comments were made.

Question #3

Small group meetings:	#	%
Were effectively incorporated into the workshop.	5	71
Should have been included, but were not.	2	29
Were not necessary and were not included.	0	0

Question #3 (Continued)

	#	%
Added nothing to workshop effectiveness and should have been omitted.	0	0

Comments: _____

An overwhelming majority (71%) of the participants felt that the small group meetings were incorporated effectively into the workshop. No comments were made.

Question #4

Audiovisual presentations:	#	%
Were used with great effectiveness.	5	71
Were not as effectively used as they might have been.	2	29
Were not used, but would have been helpful.	0	0
Were not necessary for this workshop and were not used.	0	0
Were relied upon too heavily.	0	0

Comments: _____

Seventy-one percent of the participants found the audiovisual presentations to be used with great effectiveness. No comments were received.

Question #5

Opportunity for discussion:	#	%
Was adequate and greatly helped the group's understanding of topics presented.	5	71
Was limited, but adequate for purposes.	2	29
Was inadequate.	0	0

Comments: _____

A vast majority (71%) of the respondents found the opportunity for discussions to be adequate and a great help to the understanding of topics. No comments were included.

Question #6

On the whole, this workshop was:	#	%
More effective than others I've attended.	4	57
Similar to others of its type I've attended.	0	0
Not as effective as others.	1	14
This is the first workshop of this type I've attended.	2	29

Comments: _____

Four (57%) of the workshop members felt the workshop was more effective than others they had attended, while twenty-two percent had never attended a workshop of this type. No comments were made.

Question #7

As a participant, I felt:	#	%
Very welcome to ask questions or seek additional help at any time.	5	71
Welcome to ask questions when they were asked for.	2	29
Somewhat uneasy about asking questions.	0	0

Comments: _____

Five (71%) of the participants felt very welcome to ask questions or seek additional help at any time. No comments were received.

Question #8

I intended to implement methods or materials introduced in this workshop.	#	%
---	---	---

<u>Question #8 (Continued)</u>	#	%
Immediately.	5	71
Within the next year.	2	29
At some future date, though I can foresee no immediate use for them.	0	0
Never.	0	0
Comments: _____		

A majority of the participants (71%) planned to implement methods or materials introduced in the workshop immediately. All participants planned to use the materials within the next year. No comments were included.

Information Concerning Improvements For Future Workshops

The following section presents the questions asked in order to seek ways to improve future workshops. Each question that was asked is followed by a brief summary of comments made by participants.

1. What part of the program was of most value to you as a health occupations educator?

Workshop members indicated several topics they found to be of value. Two participants valued the micro-teachings and learning to write objectives. Others found such things to be valuable as: becoming a learning manager, meeting with their health occupations teachers, laboratory management and organization and the responsibilities of health occupations teachers.

2. What part of the program was of least value to you?

Participants found the part of the workshop dealing with safety to be of little value as it was not geared to their immediate needs.

Two participants found the history and philosophy of vocational education to be unnecessary. One participant felt the lecture on vocational student activities was of little value to him/her as he/she had been deeply involved in VICA for many years.

3. What topics would you like offered at the next workshop?

Participants indicated they would like the next workshop to include methods of supervising large groups of students in divided situations, legal aspects of health occupations, development of lesson plans, individualized instruction, audiovisual instruction and evaluation. Another participant indicated that such things as basic skills in medical laboratory work and office management should be included in the next workshop.

4. What would you consider the single most important concept gained from this workshop?

Workshop members found many concepts to be of great importance. One participant found the role of health occupations in vocational education and the concept of planning each teaching and making it effective to be of the most importance. Others felt that the concepts of history and philosophy of vocational education, individualized instruction and the effects of audiovisual instruction to be of great value.

5. Please describe your overall reaction to the workshop.

(Was it what you expected, useful, suggestions for improvement!)

Participants felt the workshop was excellent and quite useful. They also felt more workshops are needed. Several felt they gained a lot from communicating with the other participants.

Evaluation In Health Occupations Education Workshop

Questionnaires were mailed to workshop participants. Of the ten, seven (70%) completed questionnaires were returned. The findings are presented as follows: implementation of information gained in the workshop, an evaluation of the workshop and suggestions for improving the workshop.

Implementation of Information Gained In The Workshop

Table 3.8 summarizes when the workshop participants plan to implement or did implement knowledge received while at the workshop into their classroom. A vast majority of the workshop participants planned to implement the information within the year or had already implemented the information.

Workshop Evaluation

In the section below, the findings of the evaluation of the workshop on evaluation in health occupations education are presented. The findings are based on the results obtained from questionnaires completed by workshop participants.

Question #1

Overall, the workshop was:	#	%
Very worthwhile in terms of answering my immediate needs.	5	71
A worthwhile experience, though some of my immediate needs were not met.	2	29
Of limited value.	0	0
Comments: _____		

TABLE 3.8

IMPLEMENTATION OF EVALUATION IN HEALTH OCCUPATIONS EDUCATION
WORKSHOP INFORMATION INTO THE CLASSROOM

<u>Presentation</u>	<u>Immediately at the beginning of the school year</u>		<u>Later on in the school year</u>		<u>Within the next school year</u>		<u>At some future date, though I can foresee no immediate use for them</u>		<u>Never</u>	
	%	#	%	#	%	#	%	#	%	#
Instructional Accountability										
a. Evaluation vs Accountability	57	4	29	2	14	1	0	0	0	0
b. Relationship of Behavioral Objectives to Accountability	57	4	14	1	29	2	0	0	0	0
c. Influence of Behavioral Objectives on the Teaching Learning Process	71	5	0	0	29	2	0	0	0	0
d. Influence of Behavioral Objectives on the Evaluation Process	43	3	29	2	29	2	0	0	0	0
Development of Behavioral Objectives										
a. Components of a Behavioral Objective	57	4	14	1	29	2	0	0	0	0
b. Specific Behavioral Objectives	57	4	0	0	43	3	0	0	0	0
c. General Behavioral Objectives	57	4	14	1	29	2	0	0	0	0
d. Points in Writing Behavioral Objectives	43	3	14	1	43	3	0	0	0	0

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TABLE 3.8
(Continued)

<u>Presentation</u>	<u>Immediately at the beginning of the school year</u>		<u>Later on in the school year</u>		<u>Within the next school year</u>		<u>At some future date, though I can foresee no immediate use for them</u>		<u>Never</u>	
	%	#	%	#	%	#	%	#	%	#
Preassessment										
a. Preassessment of Entry Behavior	43	3	57	4	0	0	0	0	0	0
b. Preassessment of Terminal Behavior	43	3	57	4	0	0	0	0	0	0
c. Prescribing Specific Instructional Activities	57	4	14	1	14	1	0	0	0	0
Objectives and the Behavioral Domain										
a. Cognitive	71	5	14	1	0	0	0	0	14	1
b. Affective	57	4	14	1	0	0	0	0	14	1
c. Psychomotor	71	5	0	0	0	0	0	0	14	1
Evaluation										
a. Norm-referenced	14	1	29	2	14	1	0	0	29	2
b. Criterion-referenced Evaluation	43	3	29	2	14	1	14	1	14	1
c. Implementing a Criterion-referenced Evaluation System	43	3	14	1	29	2	14	1	0	0
d. Differences Between the Grading and the Evaluation Process	57	4	0	0	29	2	0	0	0	0

51

TABLE 3.8
(Continued)

Presentation	Immediately at the beginning of the school year		Later on in the school year		Within the next school year		At some future date, though I can foresee no immediate use for them		Never	
	%	#	%	#	%	#	%	#	%	#
Methods of Evaluating Attainment of Behavioral Objectives										
a. Paper and Pencil Test										
Items	71	5	14	1	0	0	14	1	0	0
b. Problem Solving Evaluation	43	3	43	3	0	0	14	1	0	0
c. Group Project	57	4	14	1	0	0	29	2	0	0
Methods of Evaluating Attainment of Clinical Behavioral Objectives										
a. Meaning of Clinical Practice	71	5	14	1	14	1	0	0	0	0
b. Observation Methods	71	5	29	2	0	0	0	0	0	0
c. Written Communication Methods	43	3	43	3	14	1	0	0	0	0
d. Oral Communication Methods	86	6	0	0	14	1	0	0	0	0
Individual Project										
a. Analyze Research	43	3	14	1	0	0	29	2	14	1
b. Application	57	4	29	2	14	1	0	0	0	0

52

Seventy-one percent of the respondents felt the workshop was quite worthwhile in meeting their immediate needs. No comments were made.

Question #2

The amount of time spent on lecture:	#	%
Was too extensive.	1	14
Was about right for the material presented.	5	71
Was inadequate for the kind of materials presented.	0	0
Could better have been spent on other activities.	1	14

Comments: _____

A majority (71%) of the participants found the amount of time spent on lecture to be about right for the material presented. No comments were received.

Question #3

Small group meetings:	#	%
Were effectively incorporated into the workshop.	6	86
Should have been included, but were not.	0	0
Were not necessary and were not included.	0	0
Added nothing to workshop effectiveness and should have been omitted.	1	14

Comments: _____

Six (86%) of the respondents found the small group meetings to be effectively incorporated into the workshop. No comments were received.

Question #4

Audiovisual presentations:	#	%
Were used with great effectiveness.	3	43
Were not as effectively used as they might have been.	0	0
Were not used, but would have been helpful.	2	29
Were not necessary for this workshop and were not used.	2	29
Were relied upon too heavily.	0	0
Comments: _____		

Forty-three percent of the workshop members felt the audiovisual presentations were used with great effectiveness, while, twenty-nine percent thought they would have been helpful but were not used and another twenty-nine percent felt they were unnecessary and were not used. No comments were included.

Question #5

Opportunity for discussion:	#	%
Was adequate and greatly helped the group's understanding of topics presented.	7	100
Was limited, but adequate for purposes.	0	0
Was inadequate.	0	0
Comments: _____		

One-hundred percent of the participants found the opportunity for discussion to be adequate and a great help in understanding topics presented. No comments were received.

Question #6

On the whole, this workshop was:	#	%
More effective than others I've attended.	3	43
Similar to others of its type I've attended.	2	29
Not as effective as others.	1	14
This is the first workshop of this type I've attended.	1	14

Comments: _____

Forty-three percent of the workshop members found the workshop to be on the whole, more effective than others they had attended. No comments were made.

Question #7

As a participant, I felt:	#	%
Very welcome to ask questions or seek additional help at any time.	6	86
Welcome to ask questions when they were asked for.	1	14
Somewhat uneasy about asking questions.	0	0

Comments: _____

Six (86%) of the participants felt very welcome to ask questions or seek additional help at any time. No comments were included.

Question #8

I intend to implement methods or materials introduced in this workshop.	#	%
Immediately.	2	29
Within the next year	3	43

Question #8 (Continued)

	#	%
At some future date, though I can foresee no immediate use for them.	2	29
Never.	0	0
Comments: _____		

Sixty-two percent of the respondents planned to implement methods or materials introduced in the workshop into their classroom immediately or within the next year. No comments were made.

Information Concerning Improvements For Future Workshops

The following section presents the questions asked in order to seek ways to improve future workshops. Each question that was asked is followed by a brief summary of comments made by participants.

1. What part of the program was of most value to you as a health occupations educator?

Participants found norm-referenced, criterion-referenced and clinical evaluation to be of the most value to them as health occupations educators.

2. What part of the program was of least value to you?

One participant felt that criterion-referenced evaluation was of the least value to them because of his/her particular job setting. However, this participant did agree with the basis of the concept.

3. What topics would you like offered at the next workshop?

Participants suggested a wide variety of topics that they would like to see at future workshops. The topics included: curriculum development, creating valid tests, dental labs, methods of changing grading systems and upgrading evaluation procedures. Two participants

were interested in the legal aspects of health occupations and evaluation.

4. What would you consider the single most important concept gained from this workshop?

Participants found many aspects of evaluation to be most important. One participant felt the concept most important to him/her was that evaluation is a part of the total planning process and how to implement evaluation throughout. Others found such things as clinical evaluation, implementation of criterion-references evaluation system and manipulative skill evaluation to be of the most importance.

5. Please describe your overall reaction to the workshop. (Was it what you expected, useful, suggestions for improvement!)

Participants on the whole found the workshops to be useful and the information given was directly applicable to the calssroom. It was felt that the instructors went out of their way to vary methods of instruction. Additionally, participants agreed that the handouts were excellent and reinforced the principles taught in the workshop.

CHAPTER IV

SUMMARY AND RECOMMENDATIONS

Summary

The need for providing a means for bringing health occupations teachers together to discuss methods of strengthening and providing a common direction in health occupations education instruction will continue to grow in the future.

If such personnel are to meet state certification requirements or qualifications to teach, programs to prepare them adequately to assume teaching roles must be developed. Additionally, an organized program of advanced study for health occupations will be demanded more widely than ever before. Both the preservice and inservice health occupations education instructors need a better and more widely spread course of study available to them.

Provisions for improved instruction and leadership in developing and designing new courses are needed. Technology advances so rapidly that current methods, techniques and learning soon become obsolete, therefore, it is imperative that health occupation education instructors keep up-to-date in their field. Thus, there is an ever-increasing need to provide guidelines for new and emerging clinical experience activities.

The study indicated that an overwhelming majority of the participants had experience in nursing. Few participants had experience in other fields of health occupation² education, i.e. Medical Lab Technician, Home Economics, Dental Assistant, etc.

Regarding teaching certificates held, a vast majority of the respondents held teaching certificates. The participants having teaching

certificates were usually certified to teach more than two subject areas in health occupations education.

An overwhelming majority of the participants planned to implement or had already begun to implement information received at the workshops.

The evaluations of each of the workshops were quite good and provided feedback for possible improvements.

The participants found the workshops to be worthwhile, effective, and open. Participants agreed they felt welcome to ask questions or seek any additional help.

The information concerning possible improvements for future workshops is of great importance. From this information, future workshops will be able to more precisely meet the teachers' needs.

Recommendations

Based upon the findings of this study, the following recommendations are presented:

1. In-service activities for health occupations education instructors be provided on a continuous basis.
2. In-service activities be implemented as a comprehensive program for all health occupations education categories.
3. The delivery of inservice activities be conducted at times and locations most convenient for the health occupation education instructors.
4. The in-service activities be available for both undergraduate and graduate college credit.
5. Other future workshop content and procedures to include those suggestions gained from the evaluation-instrument.

APPENDIX A

**Selected Materials Utilized in the Dental Assisting Activities
for Health Assistant Teachers Workshop**

Dental Hygiene is a relatively new profession and little known to the average individual in our area.

A dental hygienist is a professional dental health educator and clinical operator. Her main purpose is to help enlighten the general public in proper care and maintenance of their teeth and oral tissues. She is an auxiliary to the dentist; yet is not a dental assistant. She is licensed to clean teeth, give fluoride treatments and take X-Rays; to do a direct service to the patient. She helps individuals or groups of individuals to attain and maintain optimum dental health.

The dental hygienist can perform her services in many ways. She can work in a private dental office, doing the initial cleaning or "prophylaxis" and examination. She can work in the school system for which there is a great demand. Again, she instructs the students in proper care of their teeth, does examinations, prophylaxis and fluoride treatments. There are positions open in hospitals, institutions, industry, research and schools of dental hygiene.

The hygienists' scope is entirely preventive in nature, leaving the treatment of any abnormal or pathological conditions to the dentist.

The demand for dental hygienists is great, the supply is extremely limited. As a result, salaries, hours, working conditions and benefits are very very good.

To become a dental hygienist, a young girl must complete two years in an accredited school of dental hygiene where she receives her certification and, in most instances, an associate degree in education. At this point she can go in either of two directions. (One), She can apply for and take the state examinations for licensure, which upon completion, she is qualified to work in a private dental office or do clinical work.

(Secondly) She can go on to her junior year in education at any one of a dozen universities that have courses in dental hygiene education. Upon graduation she is qualified to teach in our school systems.

To become eligible to apply for courses in dental hygiene, a young girl must have completed a total of sixteen units in fields specified below:

English.....	4 units
Mathematics.....	2 units (Algebra and Geometry)
Social Studies.....	2 units (must include American History, U.S. History or Problems of Democracy)
Science.....	2 units Biology and Chemistry (completed prior to senior year of high school.)
Electives.....	6 units (recommended that one of these six shall be Physics. Of the remaining five units, three shall be in approved fields of mathematics, history, social studies, or two years of a foreign language. In selecting the additional two units, it should be noted that only one-half credit will be allowed for subjects in the fields of Home Economics, Commercial or Industrial Arts.)

It is recommended that the Scholastic Aptitude Test of the College Entrance Examination Board be taken in May of the Junior year and December of the Senior year; the Dental Hygiene Aptitude Test be taken in fall of the Senior year.

CREED FOR DENTAL ASSISTANTS

"To be loyal to my employer, my calling and myself.

To develop initiative — having the courage to assume responsibility and the imagination to create ideas and develop them.

To be prepared to visualize, take advantage of, and fulfill the opportunities of my calling.

To be a co-worker — creating a spirit of co-operation and friendliness rather than one of fault-finding and criticism.

To be enthusiastic — for therein lies the easiest way to accomplishment.

To be generous, not alone of my name but of my praise and my time.

To be tolerant with my associates, for at times I too make mistakes.

To be friendly, realizing that friendship bestows and receives happiness.

To be respectful of the other person's viewpoint and condition.

To be systematic, believing that system makes for efficiency.

To know the value of time for both my employer and myself.

To safeguard my health, for good health is necessary for the achievement of a successful career.

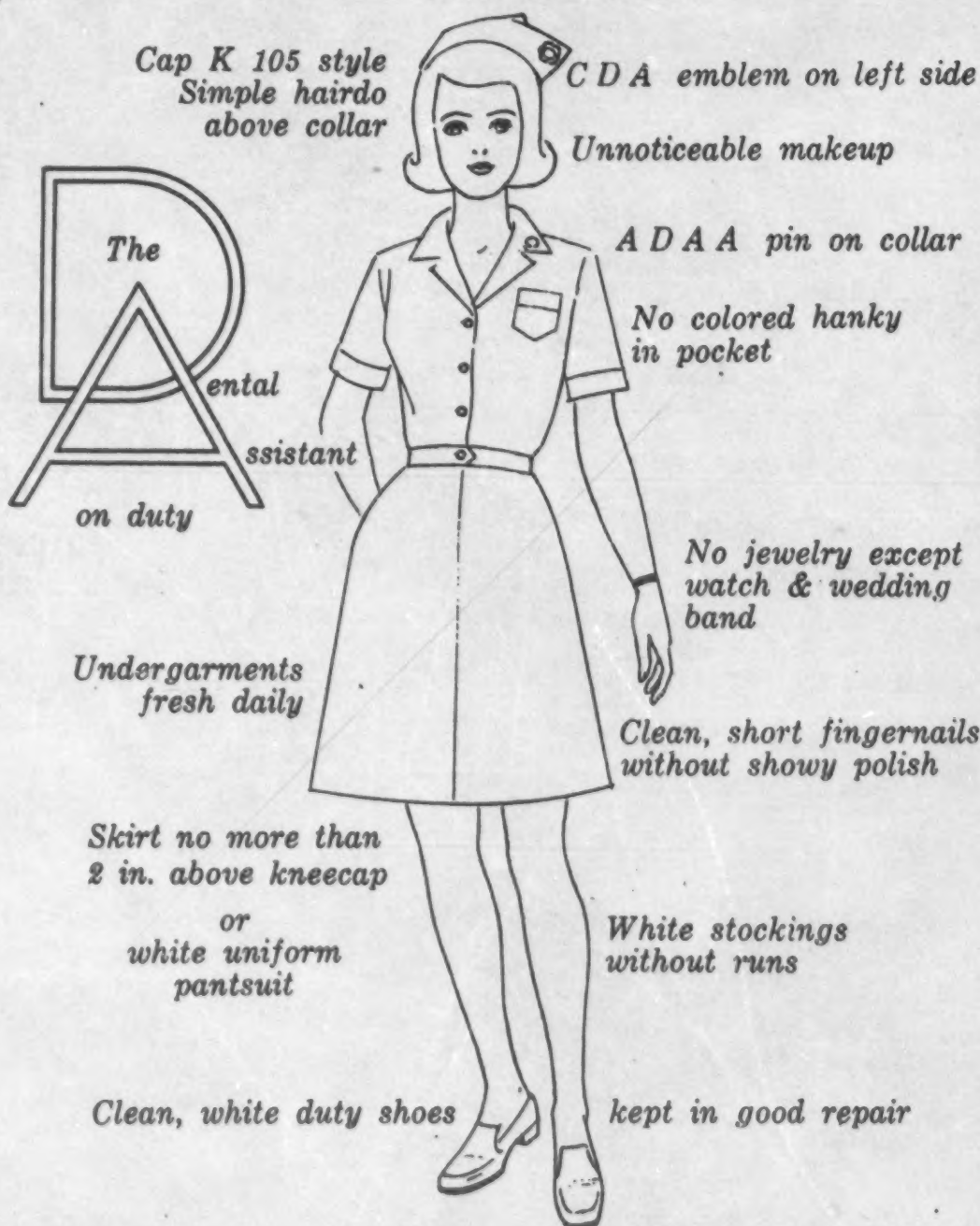
To be tactful — always doing the right thing at the right time.

To be courteous — for this is the badge of good breeding.

To walk on the sunny side of the street, seeing the beautiful things in life rather than fearing the shadows.

To keep smiling always."

— Juliette A. Southard



Fresh uniform every day,
daily bath and deodorant
a must. Brush your teeth
when you return from
lunch. Be considerate of
your patients and keep a

breath deodorant handy
for use by both you and
the dentist during the day.
Keep your own mouth in
good dental repair and
then SMILE.

BERKS COUNTY VOCATIONAL - TECHNICAL SCHOOL - EAST

DENTAL ASSISTANT

INFORMATION SHEET
NO.

DENTAL MATERIALS

AMALGAM

INTRODUCTION:

The silver filling, of which you may have many samples in your teeth is not all silver. The American Dental Association Specification number 1 for dental amalgam alloys requires the chemical composition to be within the following limits: silver 65% min.; tin 25% min.; copper 6% max.; zinc 2% max.. Amalgam or silver amalgam, a silver alloy is most common filling material used.

HISTORY:

In the 1800's the first amalgam was composed of simple alloy of silver and mercury. Filings of silver coins and mercury were mixed. This sets slowly and has a bad tendency to shrink. This fell into a bad repute with the dental profession. Later Dr. Black, in 1895, made real progress with the physical properties of amalgam, using an alloy of silver and tin, mixed with mercury.

INFORMATION:

- A. amalgam - a mixture of mercury with any other metal or metals.
 - 1. hydrogen in saliva combines with zinc causing the amalgam to expand.
 - a. non-zinc alloys used in cases of moisture contamination. But zinc makes a better restoration.
 - b. generally used for children, usually tarnishes and doesn't polish well.
 - 2. alloys furnished in form of filings or pellets. Pellets are the most common - quick and simple.
- B. mercury - liquid metallic element. Combined with silver alloy to make silver amalgam for restoring teeth.
 - 1. caution when handling, remove all rings.. It will attack gold, turns it white on contact, gradually evaporates, leaving the gold in a crystalized state and it will fracture.
 - 2. thought to be poisonous, but mixed with silver alloy, it will form a very stable metallic alloy.

C. mixing amalgam:

1. Process #1

- a. two dispensers of filings and mercury are ejected into the mortar (dish).
- b. treturation (mechanical mixing) now begun.
The pestle should be held with a finger or pen grasp. It isn't held in a fist or palm grasp. (21 lbs. pres.) Moved in a rotary fashion for 1 min. at 150 - 200 RPM.
- c. first 30 sec. alloy has absorbed the mercury and should appear dull, the second 30 sec. mix is smooth and shiny. It will be plastic enough to adhere to the sides of the mortar and curl over. Now it is ready to use.
- d. squeeze cloth is used to remove the amalgam.
- e. excess mercury is removed by squeezing the cloth, with finger pressure. Done over a scrap box. Both mercury & alloy have a reclamation value.

2. Process #2

amalgamator - wiggle bug - treturator

- a. dispense alloy pellet into the amalgamator capsule - never touch the pellets. Add the mercury - hold vertically to dispense.
 - b. insert the pestle into the capsule & insert into amalgamator.
For 2 or 3 units of alloy, set at 15 sec.
pestle is a metal piston or ball
 - c. amalgamator turns off automatically, remove contents onto squeeze cloth. If mix is not shiny and smooth, set pestle aside and treturate for 5 sec. This procedure is called "mulling".
3. important variable of amalgam fillings is to controll expansion, based on alloy-mercury ratio & mixing time.
- a. undermixed: some particles are not covered by mercury, causing non-cohesion, excessive expansion, slow set.
 - b. overmixed: causes breaking up of alloy, reduced expansion, possible shrinkage, faster set, particle size is smaller.
 - c. drier mix: faster set
wet mix: slower set (a low crushing strength)

D. Two Techniques of Ratio

1. Standard 8-5 ratio:

- a. 8 parts mercury & 5 parts alloy
- b. after mixing squeeze out 3 parts mercury (there for easier mixing) leaving 5-5 ratio.

2. Eame's:

- a. 5 parts mercury & 5 parts alloy, get faster set.

E. Mulling - rolling & kneading process, which conditions the material, plus gets it in a lump.

1. after removing amalgam from the capsule, mull the amalgam

F. Once amalgam is mixed: (as soon as possible in close proximity with the Dr.)

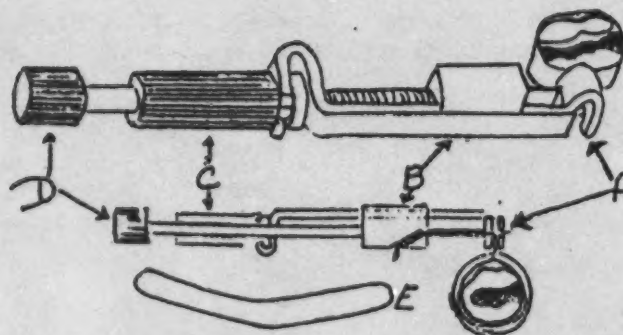
1. as you're loading the carrier, properly mixed amalgam gives off an "amalgam cry" the sound of freshly and properly mixed amalgam.
2. after the dentist has ejected the amalgam into the cavity prep., remove the carrier with your left hand and a small plugger (condenser) is passed with your right hand. PASS WITH RIGHT, RECEIVE WITH THE LEFT.
3. Working time is 3-4 minutes.
4. purpose of condensing:
 - a. force alloy particles as close together as possible so density is obtained.
 - b. force plastic mass into intimate contact with the tooth structure missing.
5. continue this method of passing instruments until the cavity prep is over-filled. Make sure the carrier is unloaded at the end of the procedure.
6. carving:
 - a. pass largest carver of his preference, first. Frahm's, Wards or discoid-cleoid. Natural function and appearance is carved into the restoration.
 - b. height of restoration should be checked with articulating paper.

G. odd facts about amalgam:

1. good mix of amalgam will have high, ultimate crushing strength. Restoration is strong and will give years of service to the patient. Life span 7 - 12 years.
2. patient should be instructed not to eat for 1 hour. Chemical setting continues for the first 24 hours.
3. polishing is done after the 1st, 24 hrs.. Important not only for appearance but corrosion and tarnish are prevented.

H. matrix bands:

1. compound or complex amalgam restorations:
matrix band is used with matrix retainer & wooden wedge to create a false wall around the tooth during restoration.
2. most common - Tofflemire matrix band & retainer.
 - a. retainer sits near the muco-buccal fold.
 - b. wooden wedges, used to hold band tightly against the tooth, near the gingival line to prevent an "overhang" - a little end of amalgam under the gingiva that is abnormal).
3. Ivory matrix band & retainer:
 - a. a second type, but not as common because of placing is time consuming.
4. Matrix retainer parts:
 - a. slotted head (A)
 - b. band locking seat (B)
 - c. band stretching screw (C)
 - d. band locking screw (D)
5. Matrix band (E)
 - a. shaped as an "open U"
 - b. bring ends together and one side of loop formed will be wider than other



I. Definitions:

1. alloys - a mixture of 2 or more metals
2. amalgamation - the mixing of mercury (a metal in a liquid state at room temperature) with other metals in a solid state, producing a new alloy.
3. trituration - the mixing procedure
4. flow - change in shape which a material exhibits under stress of a load.

J. Contributions of the alloy components:

Silver	increases strength, expansion, reduces flow, helps resist tarnish.
Copper	increases strength, expansion, hardness, reduces flow
Tin	reduces strength, hardness, expansion (or increases contraction) increases hardening time, makes amalgamation easier because of greater affinity for mercury than either silver or copper. Works to counteract with silver for rapid hardening & high expansion.
Zinc	barely significant with regard to properties of strength, flow, etc. works detrimentally in the presence of moisture contamination producing a delayed expansion caused by a liberation of hydrogen in the final restoration. Removes oxides & impurities during manufacturing & amalgamation.

BERKS COUNTY VOCATIONAL - TECHNICAL SCHOOL - EAST

DENTAL ASSISTANT

OPERATION SHEET
DENTAL AMALGAM

OPERATION SHEET # 8

HOW TO TRITURATE AMALGAM (MECHANICAL AMALGAMATOR)

INTRODUCTION:

Triturating instruments that are actuated by electric motors have been used with varying degrees of success. It does provide a means of standardizing the amalgam technique so a uniform mix of amalgam may be obtained after each time.

MATERIALS:

Mechanical amalgamator
capsule and pestle
alloy pellets
mercury

squeeze cloth
brush
cotton tip applicator
cotton roll

PROCEDURE:

1. Assemble materials.
2. Open capsule, be sure pestle is inside.
3. Place pellet dispenser over capsule and release one pellet.
4. Place mercury dispenser over open capsule and release one portion of mercury.
5. Place top on capsule and secure.
6. Place capsule in the prongs of the amalgamator.
7. Set timer on amalgamator
 - a) ten seconds for 1 unit
 - b) 12 seconds for two units
 - c) 15 seconds for 3 units
8. Turn the switch to the red line and push the black button in.
9. When timer switches off the mechanism, lift capsule from the prongs.
10. Open capsule and empty contents onto squeeze cloth.
11. Remove pestle from mass, and return amalgam to the capsule. * work through the squeeze cloth so that your fingers do not touch the amalgam.

OPERATION SHEET
DENTAL AMALGAM

OPERATION SHEET #8

12. Replace the capsule into the prongs and triturate for 3 seconds.
13. Open capsule and shake amalgam onto the squeeze cloth.
14. Mull the amalgam together into a uniform mass in the shape of a log.
15. Amalgam is ready to be placed into the carrier.

CAUTION:

During the entire procedure of mixing amalgam and mulling, never touch the mix. Moisture from your hands will contaminate the amalgam.

BERKS COUNTY VOCATIONAL-TECHNICAL SCHOOL - EAST
DENTAL ASSISTANT

INFORMATION SHEET
DENTAL TRAY SET UPS

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AMALGAM TRAY SET UP

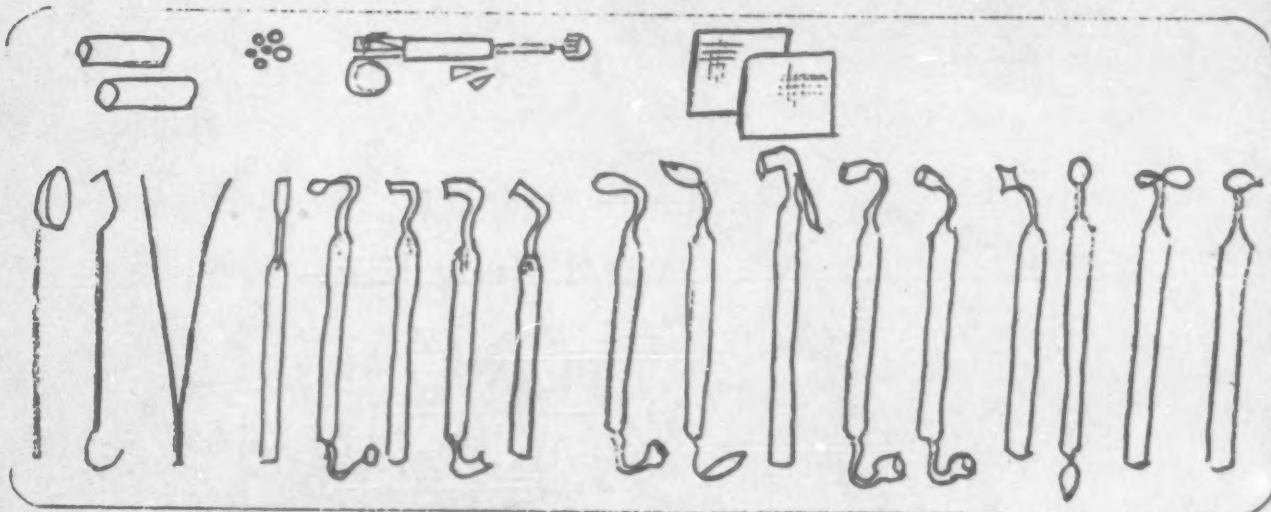
INTRODUCTION:

Tray set ups are used to save time during the preparation and restoration of a tooth. Each item needed for the procedure is placed on the tray, left to right, in the order of their use. Therefore there is no interruption during the dental operation.

MATERIALS NEEDED:

- GROUP #1 3 basic instruments
 - GROUP #2 5 handcutting instruments
 - GROUP #3 2 plastic instruments
 - GROUP #4 amalgam instruments: carrier, 2 pluggers (condensers), 2 burnishers, 2 carvers.
- Also, cotton rolls, 1 2x2 gauze, cotton pellets (if using coapalite) tofflemire matrix retainer & band (if a compound or complex prep) and wooden wedges.

ON THE COUNTER: Dr's choice of base material (dycal, cement), mixing slab, spatula, copalite or equal varnish, amalgam materials (amalgamator, capsules, alloy pellets, mercury, cotton pliers), syringe and topical anesthesia, bars.



BERKS COUNTY VOCATIONAL-TECHNICAL - EAST
DENTAL ASSISTANT

INFORMATION SHEET
DENTAL TRAY SET UPS

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PROPHYLAXIS TRAY SET UP

INTRODUCTION:

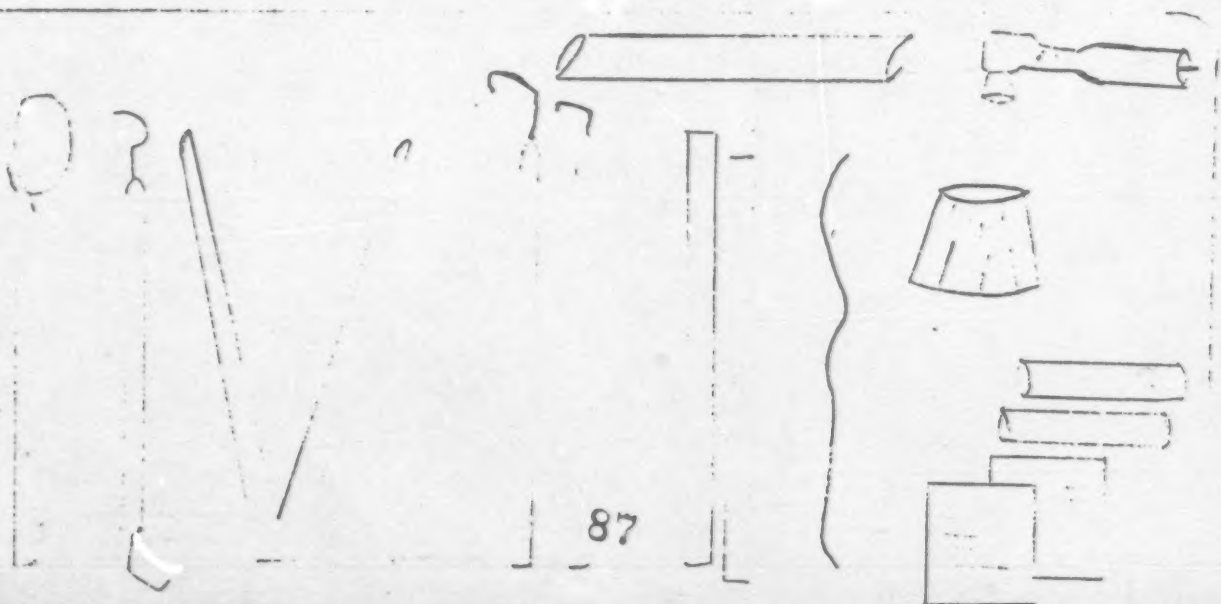
Prophylaxis tray set up will vary upon the age of the patient and the oral condition. For children, scalers and strips are not needed. Adults receive a scaling to remove the accumulated calculus. Children receive a fluoride treatment at this dental visit (unless it is in the prophy paste), and adults do not. Usually they receive instructions in plaque control or oral hygiene techniques.

MATERIALS NEEDED:

- GROUP #1 3 basic instruments
- GROUP #2 2 scalers
- GROUP #3 linen / finishing strips
- GROUP #4 dental floss
- GROUP #5 prpohy paste in a dappen dish
- GROUP #6 cotton rolls
- GROUP #7 2 to 3 2x2 gauze
- GROUP #8 aspirator tip or saliva ejector

MATERIALS NOT ON THE TRAY:

apron to protect the patient's clothes, hand mirror, usually x-rays are taken at this time, have the films and holder of choice ready.



BERKS COUNTY VOCATIONAL-TECHNICAL SCHOOL - EAST
DENTAL ASSISTANT

INFORMATION SHEET
DENTAL TRAY SET UPS

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SILICATE TRAY SET UP

INTRODUCTION:

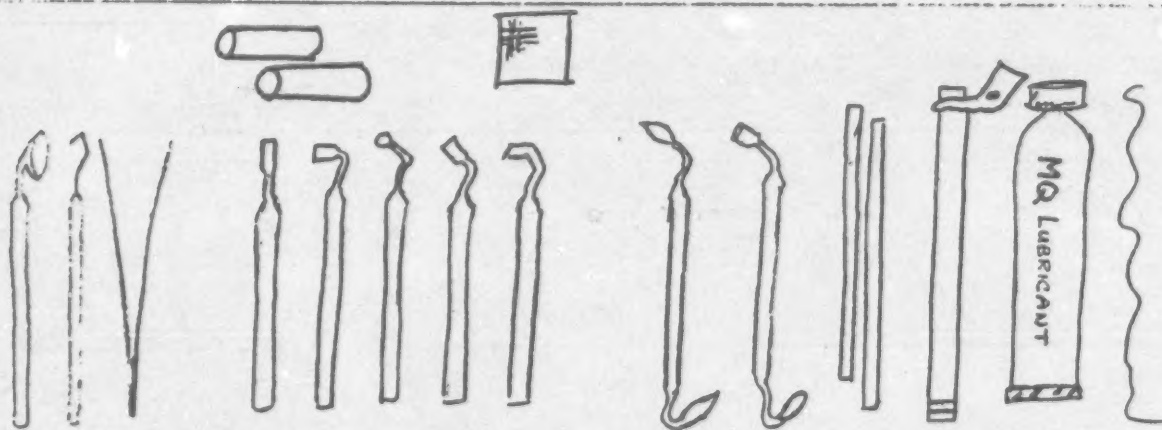
Tray set ups can be done prior to the seating of the dental patient. This will save time during the procedure and after seating the patient. The trays are set up starting on the left to the right in the order of their use in the dental operation.

MATERIALS NEEDED:

3 basic instruments
5 hand cutting instruments
plastic instrument or PPC
Ward's carver or Hollenbach's
2 finishing strips
celluloid strip & clip
Silicote or vasline
dental floss
cotton rolls
1 2x2 gauze square

MATERIALS NOT ON THE TRAY:

patient napkin & clip
shade guide
powder & liquid
glass slab & spatula
cavity liner or copalite
anesthetic (syringe set up)
burs
hand mirror



Facial anatomy

Richard J. Bischoff, DMD
William J. Simon, DDS

A review of facial bones, muscles, nerves, glands and vascular system — to reinforce the DA's comprehension of anatomical structures and functions in the area of the face.

WHY should a dental assistant study facial anatomy? One objective should be to increase her ability to communicate effectively with the dentist. A thorough background knowledge of anatomy helps to prepare her for further training in expanded functions she may later perform. Also, through a continuous endeavor to become more knowledgeable about dentistry, the dental assistant will develop greater appreciation for the dental profession and should find dental assisting more satisfying as a career.

Facial Bones

The study of bones is known as *osteology*. The osteology of the face is concerned with the development and position of 14 bones: two maxillae (upper jaw), one mandible (lower jaw), two zygomatic bones (cheek bones), two nasal bones — all bones of the face proper — plus two palatine bones, one vomer bone, two lacrimal bones and two inferior conchae — all bones that enter into the structure of the face but do not appear on the surface.

Twelve bones appear in pairs; two are single. The bones of the head are held together by sutures which are small spicules of bone interdigitated in a way that resembles a zipper. The demarcation of the individual bones of the face can be distinguished by outlining the appropriate suture between the bones. Therefore, sutures serve as an excellent study guide for locating the bones of the face.

A distinction should be made between the face, which is our primary study, and the skull proper, which includes structures of the cranium. We shall define the face as those structures of the head which surround

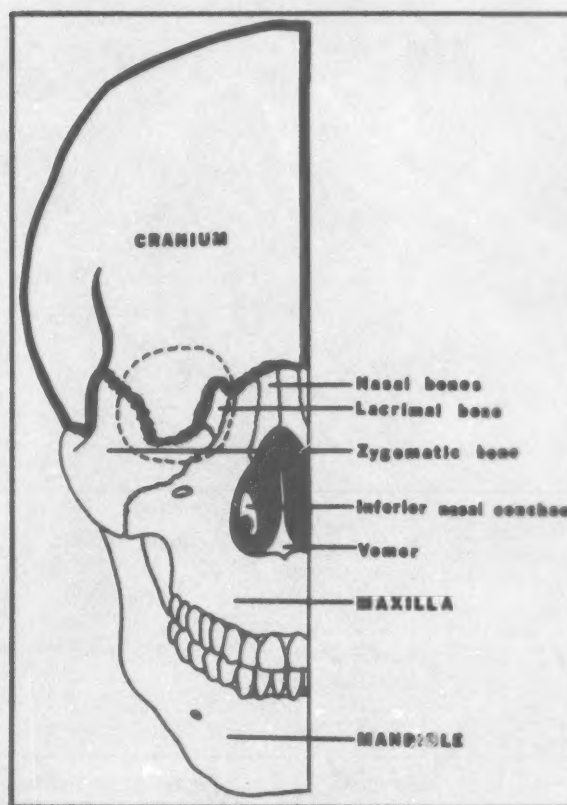


Fig 1 Frontal aspect of the facial bones.

the oral and nasal cavities and those which are adjacent to the orbit of the eye, excluding those superior to the orbit.

The nasal bones lie medially to the orbits of the eye and nose. As a paired bone, it attaches the right side of the nose to the left side.

The lacrimal bone lies lateral to the nasal bone in the socket of the eye. It forms the front wall of the medial surface of the orbit.

The zygomatic bone forms a part of the eye socket (outer wall and floor) and also forms a bridge connecting the maxilla to the cranium. This bridge is spoken of as the cheek bone.

The maxillary bone is referred to as the upper

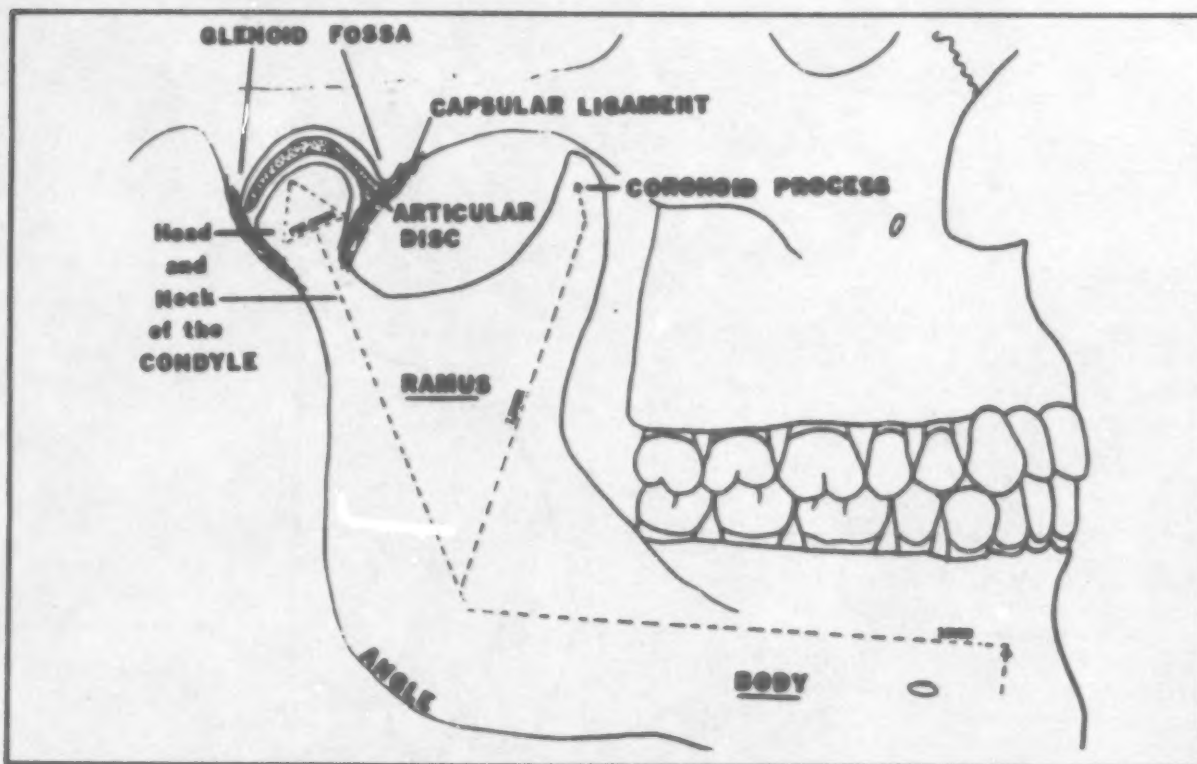


Fig 2 Lateral view of temporomandibular joint and mandible.

jaw. It is connected to the zygomatic bone, and the right and left portions join together in the midline of the face beneath the nostrils. It also forms the front portion of the roof of the mouth.

The vomer bone is a single bone within the nasal cavity which separates the right and left nostrils. When it is covered with tissue, it is spoken of as the septum.

The inferior nasal conchae is a thin bone shaped like a scroll situated on the outer wall, inside the right and left nostrils.

The mandible (lower jaw) is a single bone, located inferior to the maxilla with which it articulates by means of the temporomandibular joint.

The palatal bone lies behind the maxillary bone forming the back portion of the roof of the mouth, and the opposite side forms part of the floor of the nose. The palatal bone can be seen in Fig 3, whereas the others mentioned can be located on Fig 1.

The mandible, as noted, is a separate bone of the face which functions with the skull proper by means of a joint; as such, it requires detailed consideration.

The mandible is a solid mass of bone composed of a horizontal part, the body, and a vertical part, the ramus. At the superior surface of the ramus are two prominent protuberances of bone; the protuberance attached to the cranium is the condyle of the mandible, and the protuberance to the front of the condyle is the coronoid process.

The mandible is attached to the cranium by muscles and ligaments. The attachment process is centered essentially at the temporomandibular joint (TMJ) (Fig 2). This joint should be envisioned as a ball and socket, such as is observed in the hip joint. As the hip joint articulates with the pelvic bone, the TMJ articulates with a fossa (deep depression) of the cranium known as the glenoid fossa. A tubular sheath, called the capsular ligament, attached to the base of the cranium from which it extends to the condyle, forms a capsule surrounding the joint. This capsule functions (1) to encapsulate the structures of the TMJ and (2) as a source of attachment. The remaining three ligaments extend from the cranium to appropriate sites of insertion on the mandible.

The condyle head of the mandible is separated from the glenoid cavity of the cranium by a disk of tough fibrous tissue. This disk, the articular disk (meniscus) separates the TMJ into two cavities which contain a special lubricating fluid. The articular disk may be thought of as a compensating mechanism to protect the surface of the condylar head from rubbing on the glenoid fossa.

Channels and canals transverse the bones of the face; and openings at particular sites, called foramina (foramen), surface. Through these foramina the blood vessels and nerve fibers pass into the overlying tissue. Foramina of significance to the dentist are (Fig 3):

- Mandibular foramen: Lingual surface on the ramus of the mandible.
- Mental foramen: Outer surface of the mandible, apical to the roots of the first and second bicuspsids.
- Infraorbital foramen: On the maxilla at the inferior border of the orbit of the eye.
- Incisive foramen: On the palate of the mouth just behind the central incisors.
- Greater and lesser palatine foramen: Palate of the mouth just inside the second molar area.

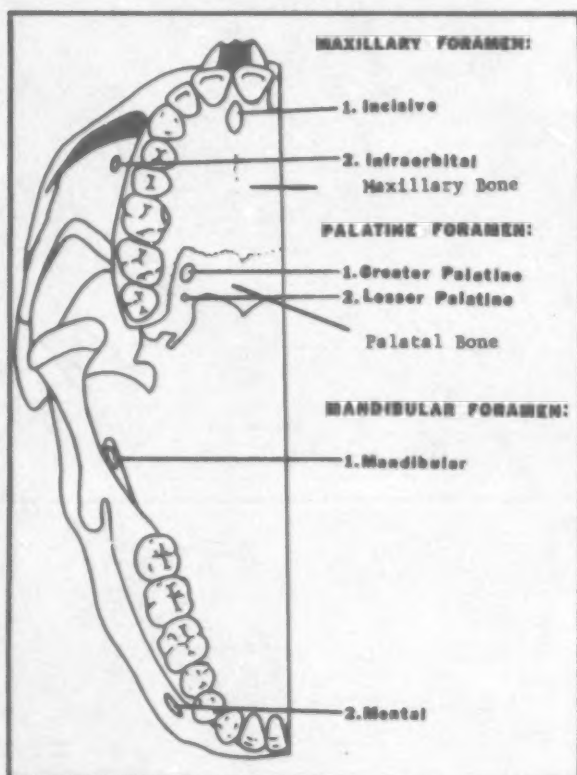


Fig 3 Foramen in bones of face.

These six foramen are significant because at these locations injections can be made to produce a block anesthesia.

Of special significance to dentistry is that part of the mandible and maxilla designated alveolar bone, for it is only through the eruption of teeth that this particular bone develops. If it were not for the eruption of teeth, the mandible and maxilla would be essentially flat intraorally. Therefore, alveolar bone proper is that part of the maxilla or mandible which circumscribes the teeth. Alveolar bone develops around the roots of the teeth as the process of eruption takes place. It is an extension of the bone from the maxilla and mandible around the appropriate teeth. If a tooth is extracted, the alveolar bone disappears.

Facial muscles

The muscles of facial expression are of significance to the dentist because of their involvement with the motions of the lips. Consequently, they have a direct effect on the developing dentition. Furthermore, abnormal habits involving these muscles may result in development of tooth malpositions with the resultant need for orthodontics (Fig 4).

The muscles of main concern to the dental profession are the (1) levator labii superioris (elevator of upper lip), (2) elevator of corner of mouth, (3) greater and lesser zygomatic muscles (4) orbicularis oris muscle (5) risorium muscle (6) depressor labii inferioris (depressor of lower lip) (7) depressor of corner of mouth (8) buccinator muscle.

The action of the levator labii superioris, levator anguli oris (elevator corner of mouth), depressor labii inferioris and depressor anguli oris are well described by their names. The orbicularis oris closes the lips and compresses them against the teeth. The buccinator presses the cheek against the teeth and pushes food between them, thus aiding mastication. The risorius retracts the angle of the mouth laterally.

While all muscles composing the lips and cheeks aid in the act of ingesting food, they are not the power muscles responsible for the movement of the mandible with the resultant action of mastication.

There are four pairs of power muscles known as the muscles of mastication. These power muscles are known as the masseters, temporals, external pterygoids and the internal pterygoids.

Perhaps the most simple way to review the muscles of mastication is to study each muscle independently starting with the most lateral, the masseter, and working inward toward the mid sagittal plane of the head.

Fig 5 is a lateral view of the masseter muscle. All muscles are attached to some structure at two locations. The attachment, which is more or less stationary, is called *origin*. The opposite attachment, which moves a structure, is called *insertion*. The masseter muscle

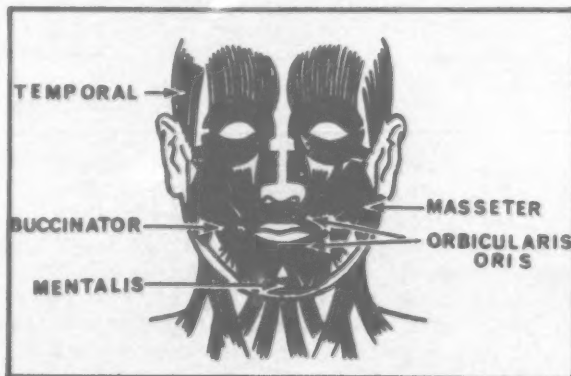


Fig 4 Muscles of face.

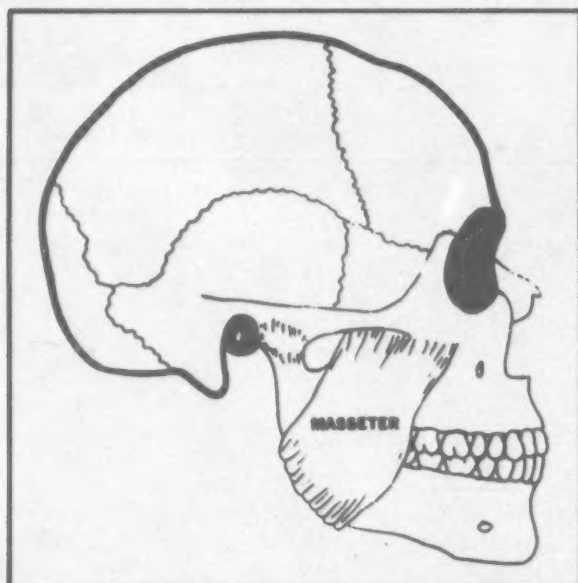


Fig 5 Masseter muscle.

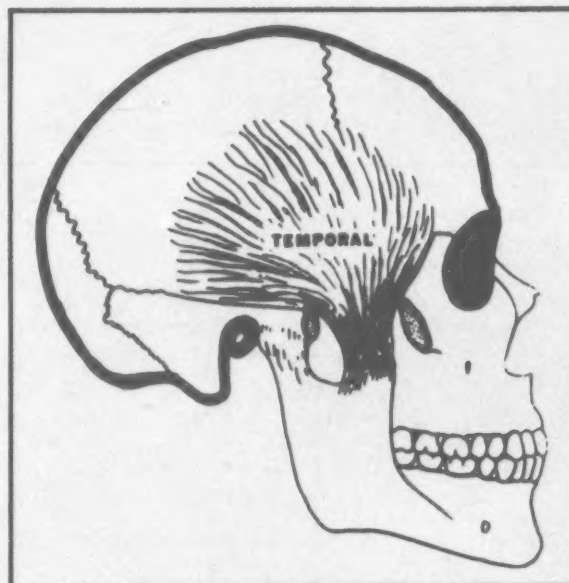


Fig 6 Temporal muscle.

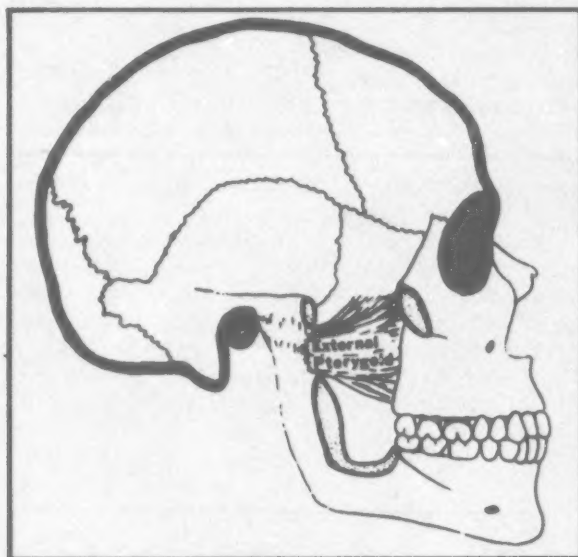


Fig 7 External pterygoid.

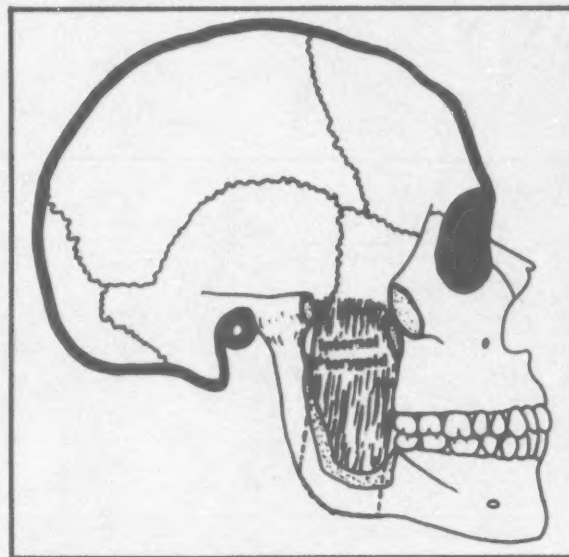


Fig 8 Internal pterygoid.

is attached to the zygomatic bone and is inserted on the ramus of the mandible. When the masseter is contracted, the molar teeth are brought into occlusion.

Fig 6 is a lateral view of the temporal muscle. (Note that the masseter muscle has been removed to show the temporal muscle exclusively.) The temporal muscle originates on the side of the cranium, then is bundled together to pass through the zygomatic arch and finally attaches to the coronoid process of the mandible. While contraction of the temporal muscle elevates the mandible, it also has a retracting action.

The zygomatic arch acts as a pulley, and contraction of the temporal muscle through this pulley can cause the mandible to retract.

If we dissect the temporal muscle, cut away the zygomatic bone and the coronoid process, the external pterygoid muscle comes into view (Fig 7). The external pterygoid originates deep inside the head on the lateral pterygoid plate of the sphenoid bone, which is part of the cranium. The external pterygoid muscle runs horizontally and inserts into the front surface of the condyle. When these muscles on the right and left

contract simultaneously, they cause the mandible to protrude. When one external pterygoid muscle contracts and the other relaxes, the right and left lateral movements of the mandible are produced.

If we dissect away the external pterygoid muscle and the lateral pterygoid plate, the internal pterygoid muscle comes into view (Fig 8). This is a strong power muscle which originates in the pterygoid fossa of the sphenoid bone, the palatine bone and the maxillary tuberosity. It is inserted on the inner (medial) surface of the angle of the ramus of the mandible below the mandibular foramen.

The internal pterygoid muscle and the masseter muscle both insert on the angle of the mandible and the ramus. Fig 9 is a dorsal view of these two power muscles showing this insertion. These four power muscles, acting together on the right and left sides, form what is termed the mandibular sling. The mandible has four classified movements — the protrusive, retrusive and the right and left lateral excursion movements. These are all controlled by the power muscles of mastication with the depressor muscles reciprocating by relaxing.

Muscles exist in a state of equilibrium, from which they can be contracted or stretched, depending upon the stimulus applied. For a simple analogy, think of the mandible as an elevator midway between the top floor and the basement of a building. The elevator can go up or down, depending upon which button is pushed to stimulate action. The mandible behaves in exactly the same manner.

In addition to the muscles that elevate the mandible, there are the muscles that depress the mandible from rest position. The muscles of the neck are paired (right and left). The names of the many muscles in the neck are combinations of where they originate and where they insert. Generally speaking, these muscles run from the inferior border of the mandible to the hyoid

bone (Adam's apple), which is slightly mobile. A second set of muscles runs from the hyoid bone to the clavicle (collarbone).

Fig 10 illustrates the two sets of depressor muscles in the neck — the hyoid group and the clavicular group. When these muscles contract in unison, the mandible is depressed. Food in the mouth will stimulate the muscles of mastication to elevate the mandible and crush the food between the teeth.

Vascular system

The vascular system is a closed passageway of tubes which circulates blood through the body. The heart is the muscular pump which forces the blood out through the arteries to the tissues of the body. The blood is collected from the tissues by a network of veins which join together and return the blood to the heart. Arteries are muscular elastic tubes, whereas veins are thin walled and contain valves to prevent blood from flowing back to the tissue. Before the blood coming from the veins is recirculated, the heart pumps it through the lungs where it is reoxygenated and purged of carbon dioxide. This process is handled by the pulmonary system. Nutrients from the food we digest are fed into the blood stream through the liver by means of the portal system. The fluid waste products accumulating in the blood are filtered out by the kidneys through the renal system.

All tissues, muscles, glands, organs and teeth in the face have an arterial supply and venous return. The arteries and veins have names related to what they nourish. Fig 11 illustrates a stripped-down version of the arteries ultimately reaching the teeth.

Arising from the ascending aorta, which is the main arterial vessel arising from the heart, are a right and a left common carotid artery. As the common carotid passes into the neck, it divides into the external and internal carotid arteries. These provide the blood

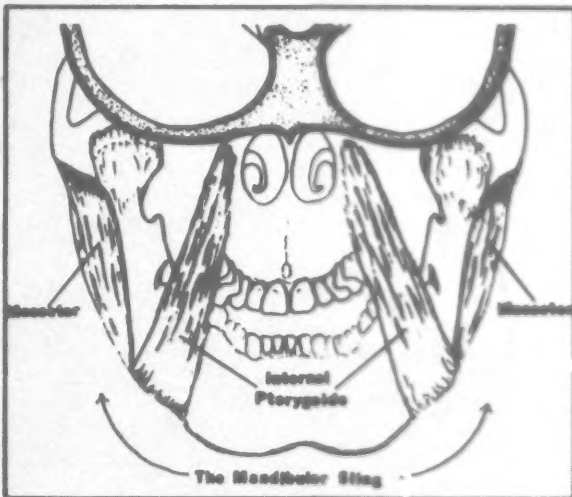


Fig 9 Mandibular sling.

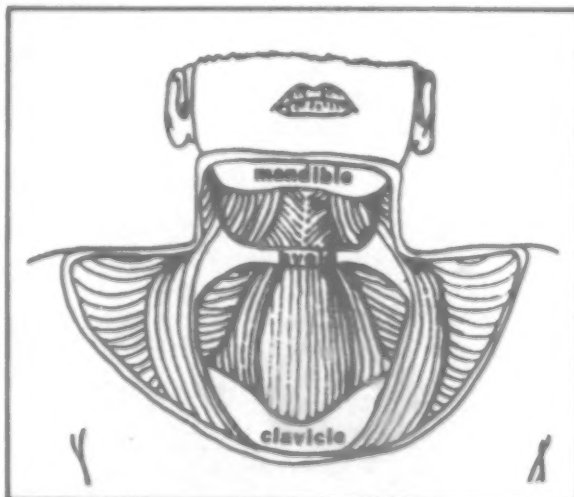


Fig 10 Oppressor muscles of mandible.

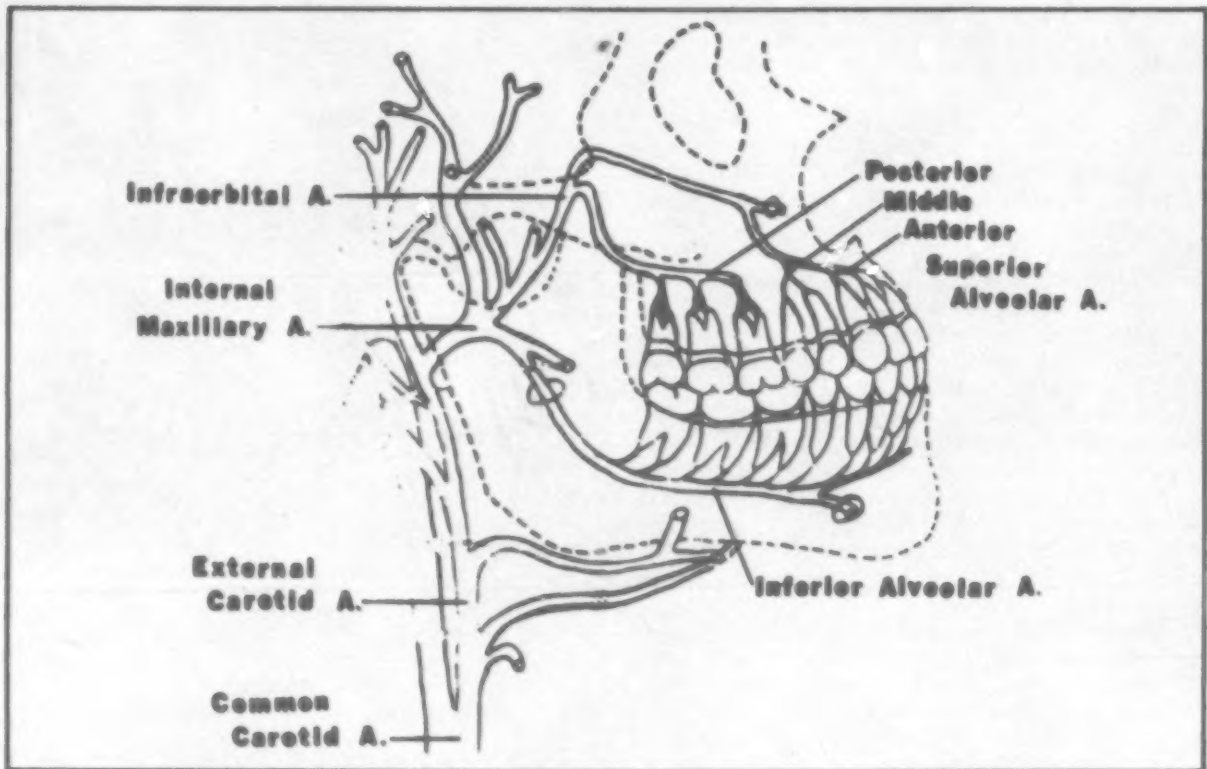


Fig 11 Stripped down version of arteries reaching teeth.

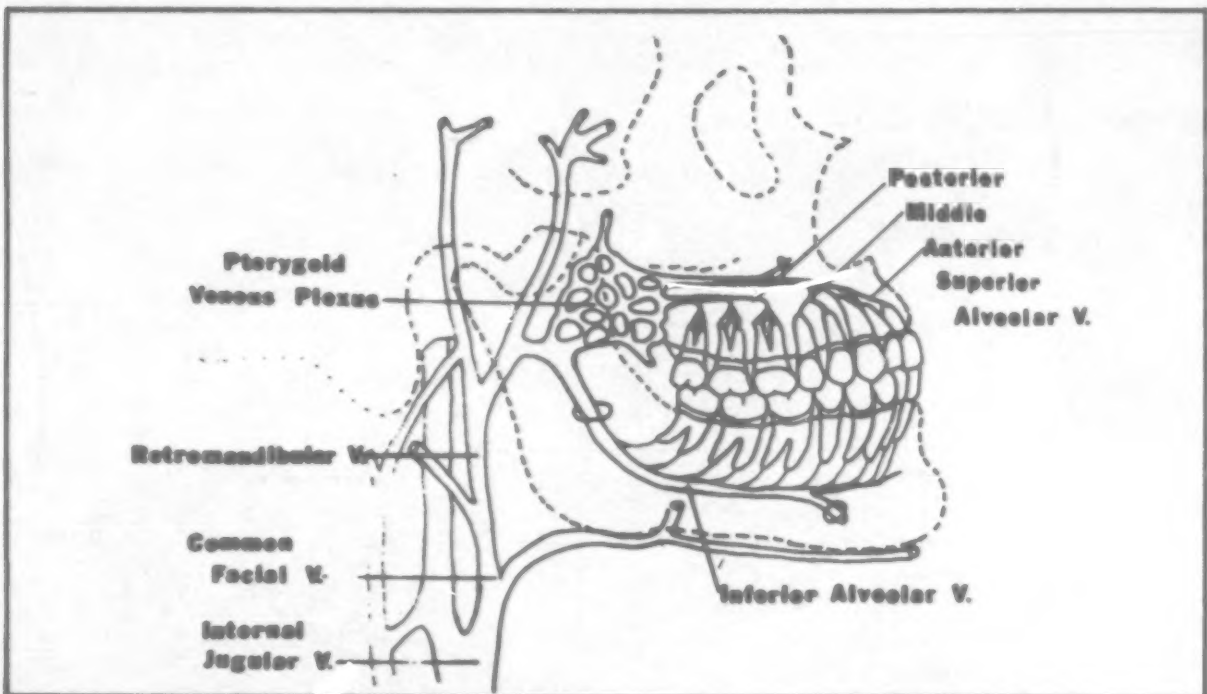


Fig 12 Venous return from the teeth.

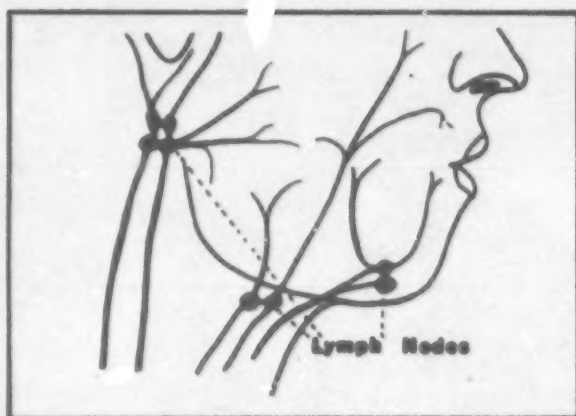


Fig 13 Lymphatic system of face.

supply to the brain and eyes. Through the branches of the external carotid the structures of the oral cavity receive their main blood supply; and through the internal maxillary branch of the external carotid the muscles of mastication, the buccinator muscles and the upper and lower teeth mainly receive their blood supplies.

The internal maxillary artery, just after branching off the external carotid, sends a branch, the inferior alveolar artery, to the mandible, from which rises the dental branch to the lower dentition. The upper teeth are supplied by three generally separate branches — the upper posterior teeth by the posterior superior alveolar artery, a direct branch of the internal maxillary artery; the upper bicusps by the middle superior alveolar artery; the anterior teeth by the anterior superior alveolar artery. These last two arteries are branches of the infraorbital artery, which is the most anterior part of the internal maxillary artery.

Muscles supplied by the internal maxillary artery are the external and internal pterygoid, the masseter, temporal and buccinator. The internal maxillary artery is of significance because of the number of oral structures it supplies.

The tongue receives its blood supply through a branch of the external carotid, the lingual artery, which branches from the external carotid in the neck just below the angle of the mandible. From there it courses under the inferior border of the mandible to the tongue.

Most superficial muscles of the face are supplied by the facial artery, a major branch of the external carotid artery, which branches from the external carotid, traverses the lower border of the mandible, then ascends in the area of the bicusps to the tissues and superficial muscles of the face.

The veins carrying blood from the pulpal tissue in the teeth back to the heart are traced and named in Fig 12. The veins leaving from the apices of teeth follow the same route as the arteries do through the maxillary and mandibular bone and enter the same foramen.

However, veins, in contrast to arteries, are soft and collapsible and during pulsation of the arteries may be compressed.

The branches of the veins are more numerous than are those of the arteries. As the veins collect and join together, they form what is known as a *plexus*. The veins from the mandibular and maxillary teeth join a plexus in the area of pterygoid muscles; hence this is called the pterygoid venous plexus (Fig 12). Blood from the pterygoid plexus drains into the retromandibular vein, which drains into the common facial vein and ultimately into the internal jugular vein back to the heart.

A third vascular system is the lymphatic system, which drains the spaces between groups of tissue and eventually coalesces into soft vessels which drain into regional lymph nodes. Lymph nodes can be likened to filters which prevent infected fluids from being recirculated until rendered inert. Facial lymph nodes vary greatly in size and number. Generally, they are located beneath the mandible, behind the ear and in the neck (Fig 13).

When a patient has an infection in the area of the oral cavity, these nodes become filled or congested and can be palpated by pressing into the superficial layers of the skin in these areas.

Nervous system

Nerves, unlike arteries and veins, which are hollow, are composed of bundles of fibers. These fibers may carry impulses from an area of the body back to the brain (sensory fibers); they may send impulses from the brain to an area of the body to stimulate action (motor fibers) or they may perform both functions (mixed fibers).

The nerves of most interest to the dental profession are the cranial nerves, which arise directly from the brain, in contrast to those which arise from the spinal cord. There are 12 pairs of cranial nerves, each designated by number and name. Of particular interest are the fifth, or trigeminal, and the seventh, or facial, cranial nerves. Most superficial tissues of the face are controlled by the facial nerve; also, the muscles that control facial expression receive branches from the facial nerve.

The maxillary and mandibular dentitions receive their innervation through the trigeminal. The trigeminal is not simply a single nerve fiber, for as it exits from the brain, it forms a ganglion from which arise three divisions of the main nerve. A ganglion is a mass of nerve cells located outside the brain and can be compared to a small switchboard for both motor and sensory impulses. The ganglion of the trigeminal nerve is called the *gasserian* or *semiluran* ganglion. It has three divisions:

- The ophthalmic (firs.) division which innervates all

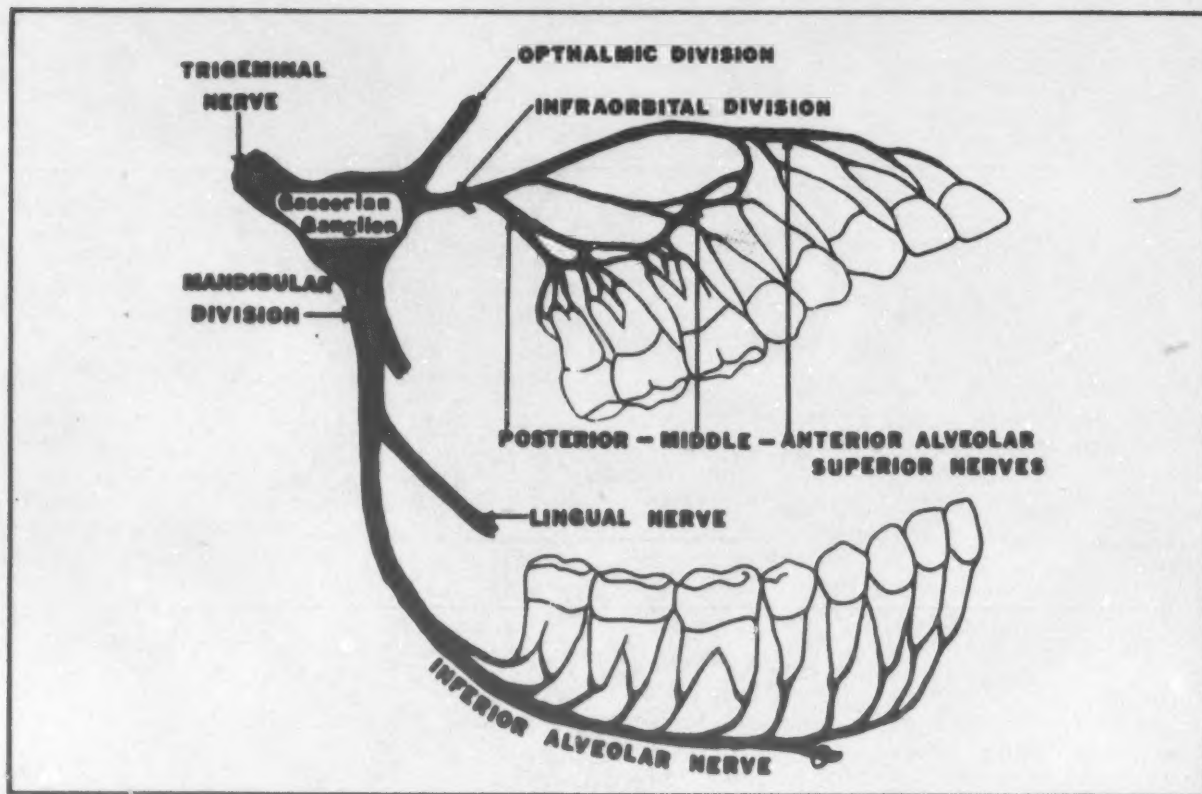


Fig 14 Innervation of the teeth.

tissues surrounding the eye, eyebrow and bridge of the nose.

- The maxillary (second) division with three branches. The largest is the infraorbital nerve, which, as it passes through the maxillary bone, sends off three branches to the maxillary teeth — the anterior superior alveolar nerve, the middle superior alveolar nerve and the posterior alveolar nerve. The terminal end of the infraorbital nerve innervates the tissues below the eye, the side of the nose and the upper lip (Fig 14). These nerves not only innervate the pulp chambers of the maxillary teeth, but also the periodontal membrane and the gingival tissue around the teeth.
- The mandibular (third) division is the largest division and sends off many branches, not only to the mandibular teeth, but also to the muscles of mastication, the tongue, lower lip and the skin of the side of the face.

Salivary gland system

Beneath the membrane lining the oral cavity (oral mucosa) are three pairs of glands — the parotid, submandibular and sublingual (Fig 15).

The parotid gland lies in front of and below the ear. The duct opens on the buccal mucosa opposite the

maxillary second molar. The submandibular gland lies near the inner surface of the angle of the mandible and travels close to the surface of the floor of the mouth, opens on both sides of the lingual frenum of the mandible. The sublingual gland is beneath the mucosa of the floor of the mouth anterior to the submandibular gland. This gland has eight to 20 openings for drainage in a line on both sides under the tongue.

These glands secrete saliva, a serous, watery-like mucus. Saliva contains a digestive enzyme, *ptyalin*, which starts the breakdown of cooked starches so they can be digested further down in the digestive tract. Even when we are not eating, saliva is secreted, bathing the teeth and keeping the oral mucosa from becoming dry, thereby aiding speech.

The parotid, submandibular and sublingual glands are the major glands; although throughout the oral mucosa are found many minor groups of serous glands, named according to their locations in the oral mucosa — buccal glands, labial glands, palatine glands, and so on.

Paranasal sinuses

The bones of the face are called flat bones, as distinguished from the long bones of the legs and arms,

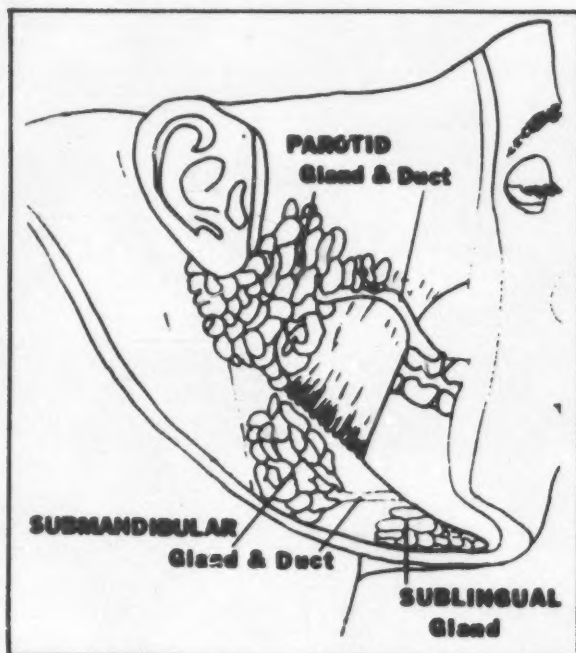


Fig 15 Major salivary gland.

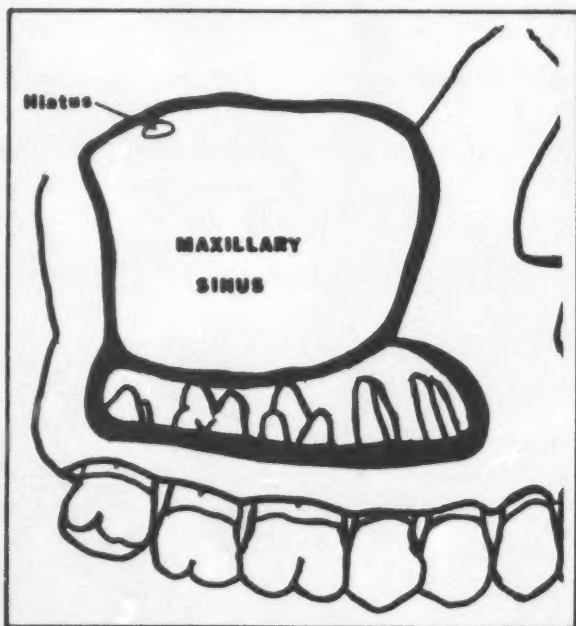


Fig 16 Cutaway showing maxillary sinus to teeth.

which are hollow and tubular. However, within flat bones lined cavities, called sinuses, do occur. The flat bones surrounding the nose contain sinuses which, as a group, are called the paranasal sinuses.

The frontal, ethmoidal and sphenoidal bones are flat bones of the cranium; and sinuses do occur in these bones in the area of the nose. The maxillary bone of the face, which forms the lateral walls of the nose, also has sinuses (Fig 16).

The maxillary sinus (also called the Antrum of Highmore) is the largest paranasal sinus. Note in Fig 16 that the sinus communicates with the lateral wall of the nose. This opening from the sinus cavity into the nasal cavity, called a *hiatus*, differs from a foramina in that it is a gap or cleft in a wall. Through this communication the tissue covering the maxillary sinus can become infected, particularly if the patient has a head cold.

Because of the location of this communication between the sinus and the nose, the sinus does not drain easily when the patient is in an upright position, and the sinus becomes congested. The congestant accumulates over the apices of the maxillary molars and bicuspids and produces symptoms related to these teeth, complicating the dental diagnosis. Unpleasant as this situation may become, the paranasal sinuses have functions:

- They act as chambers for warming the air during the process of respiration.
- They give resonance to the voice.
- They reduce the weight of the skull.

Through these basics of the anatomy of the face, perhaps your ability to communicate with the dentist has been enhanced and your appreciation of dental assisting as a career has been intensified.

Reference Reading Material

Miller, David P. Clinical dental assisting. Hagerstown, MD, Harper & Row, Inc., Publisher.

ORAL ANATOMY

Bones of the face:

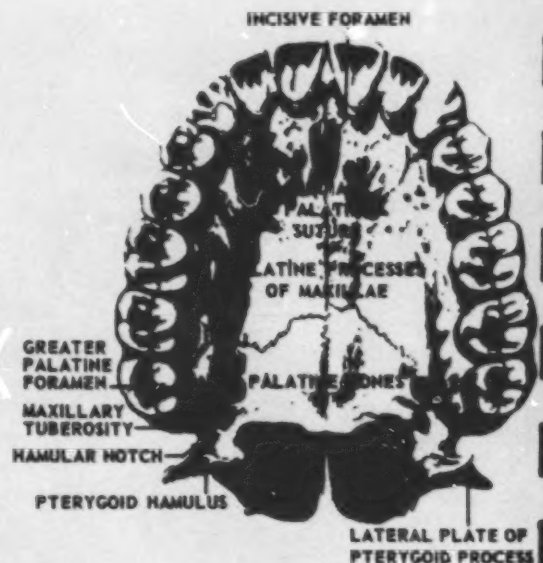
Upper Jaw

The right and left maxillae unite to form the upper jaw.

Each maxilla consists of a body and four processes:

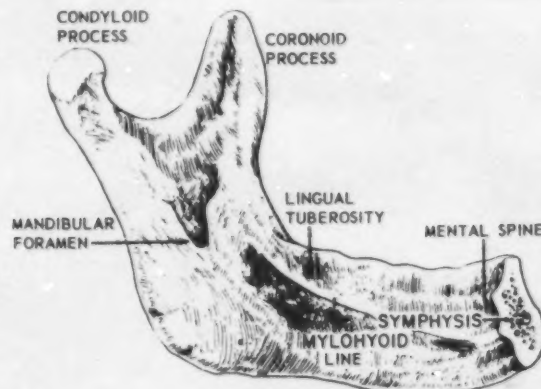
- a. Alveolar: this forms the maxillary arch. After the teeth are lost, the bone resorbs and is reduced in size. This is then called the residual ridge. The crest of the ridge is the highest continuous surface of the ridge, not necessarily in the center.
- b. Frontal: extends upward and backward along the side of the nose.
- c. Zygomatic: external surface of the maxilla. Joins with zygomatic bone to form prominence of cheek. (malar bone)
- d. Palatine: extends inward horizontally with right and left processes joining to form the anterior portion of the hard palate. The right and left palatine bones form the posterior portion. The joining of the two halves at the midline is called the median palatine suture.

The incisive foramen is at the anterior end of this suture, and at the posterior, on either side, is the greater palatine foramen.



Lower Jaw

The mandible, or lower jaw bone, consists of a curved horizontal body and two vertical rami. The condyle and the coronoid process are on the upper posterior ends of each ramus.

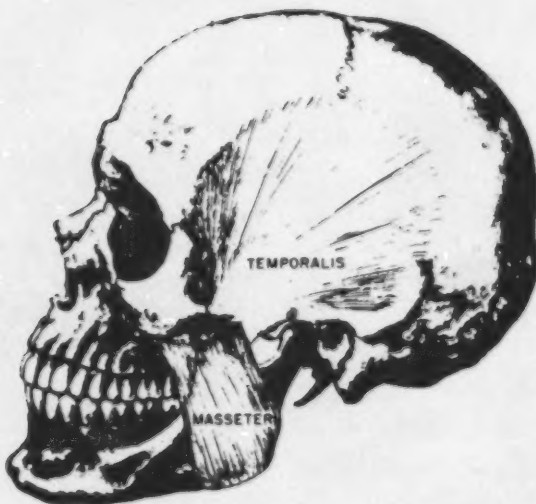


Internal surface of mandible.

Muscles of Mastication

The movements of the mandible are controlled principally by four pairs of muscles, namely:

Temporalis
 Masseter
 External Pterygoid
 Internal Pterygoid



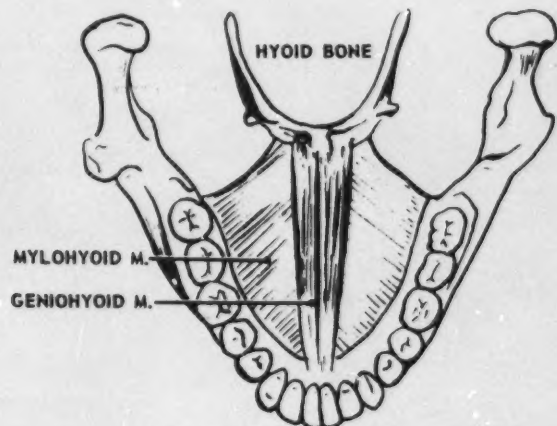
Muscles Forming The Boundaries of The Oral Cavity

Buccinator -1 permits smiling, blowing, helps confine food in mouth.

Orbicularis Oris -2 draws lips together (muscle around lips)

Mylohyoid -3 } found on the floor of the mouth, under tongue.

Geniohyoid -4 }



Muscles of Expression

Seven pairs of muscles of expression control the movements of the lips:

Quadratus labii superioris

Zygomaticus

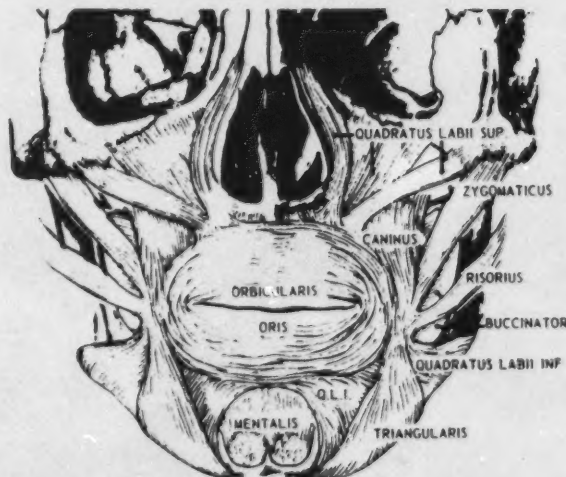
Caninus

Risorius

Triangularis

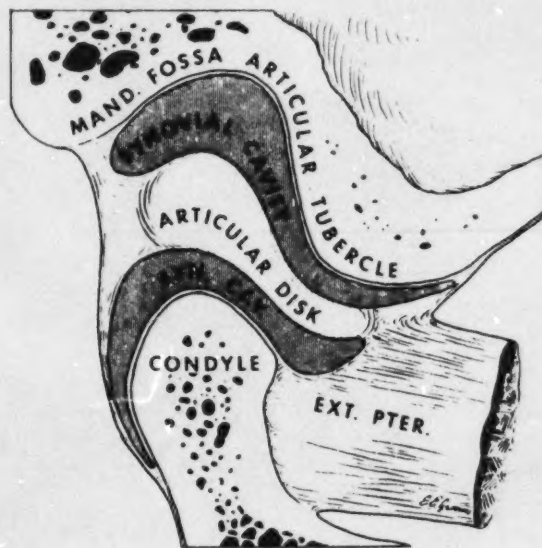
Quadratus labii inferioris

Mentalis



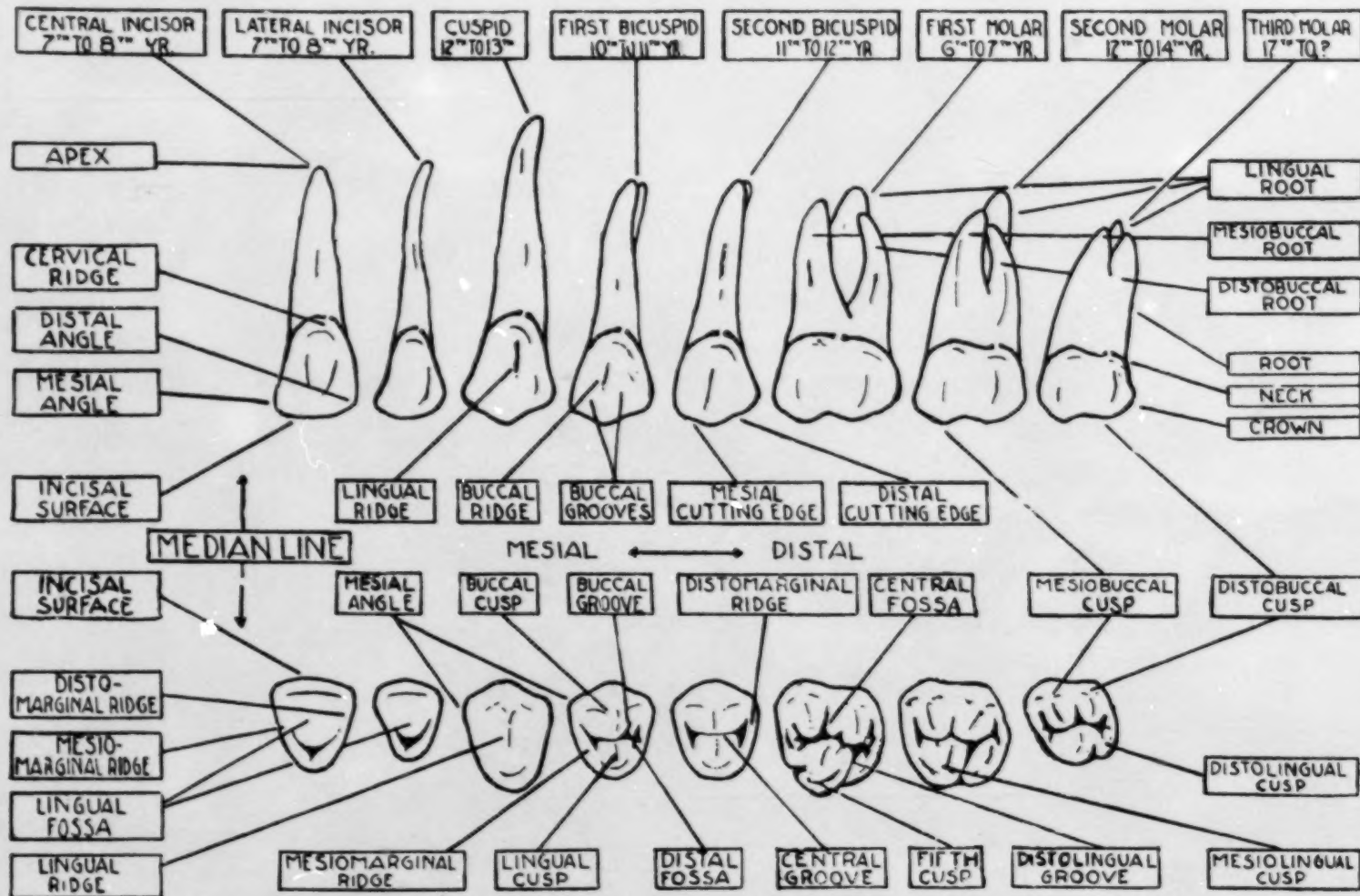
Temporomandibular Joint.

The mandible articulates with the right and left temporal bones at this joint. Within each joint the condyle of the mandible fits into the Glenoid fossa on the underside of the temporal bone. Suffice it to say that this is a very important anatomical structure which is a complete course of study in itself. We have merely mentioned it here.



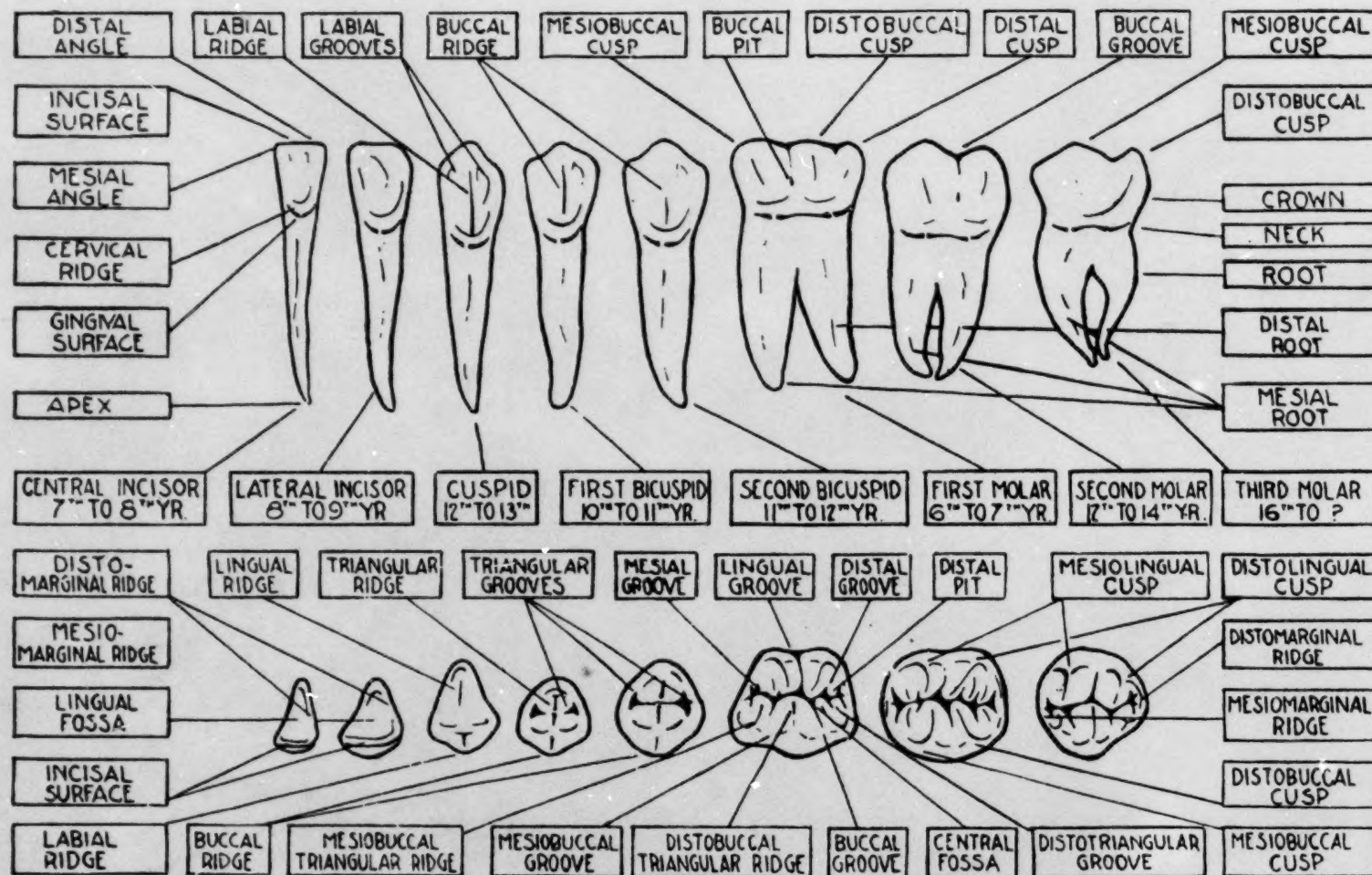
Temporomandibular joint.

Note: This is an extremely brief outline of anatomical structures with many areas omitted as they do not pertain to our study at this time.



ANATOMY OF THE UPPER TEETH

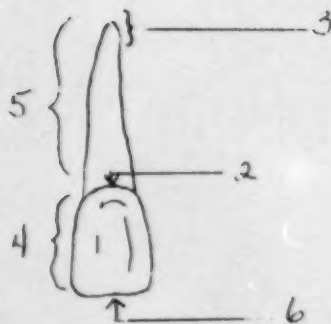
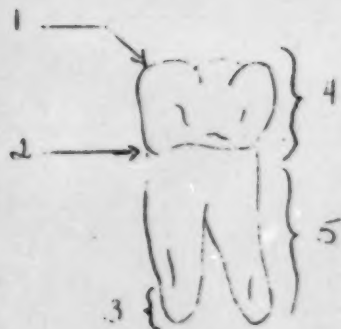
DENTAL ANATOMY



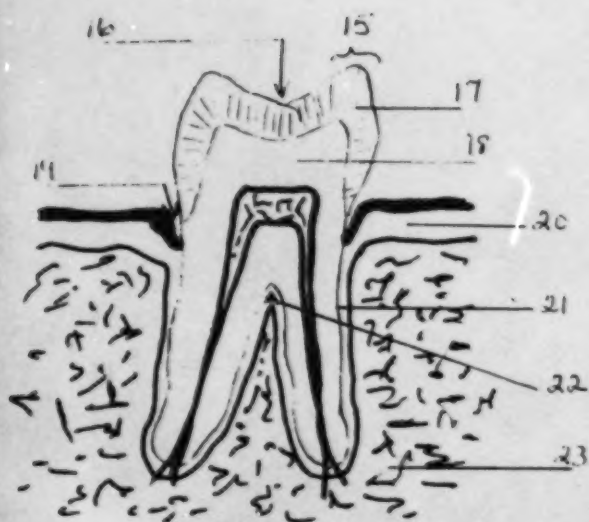
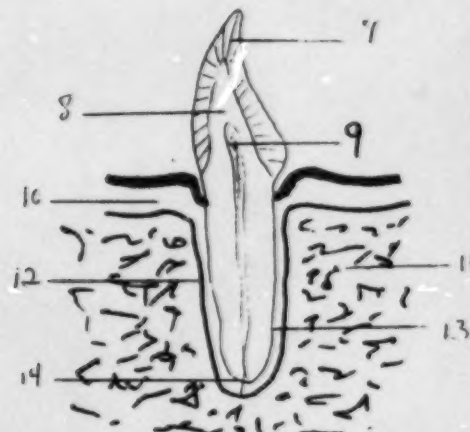
ANATOMY OF THE LOWER TEETH

TOOTH ANATOMY REVIEW QUIZ

NAME: _____



- | | |
|----|-----|
| 1. | 8. |
| 2. | 9. |
| 3. | 10. |
| 4. | 11. |
| 5. | 12. |
| 6. | 13. |
| 7. | 14. |



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| 15. |
| 16. |
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ANATOMY QUIZ

NAME: _____

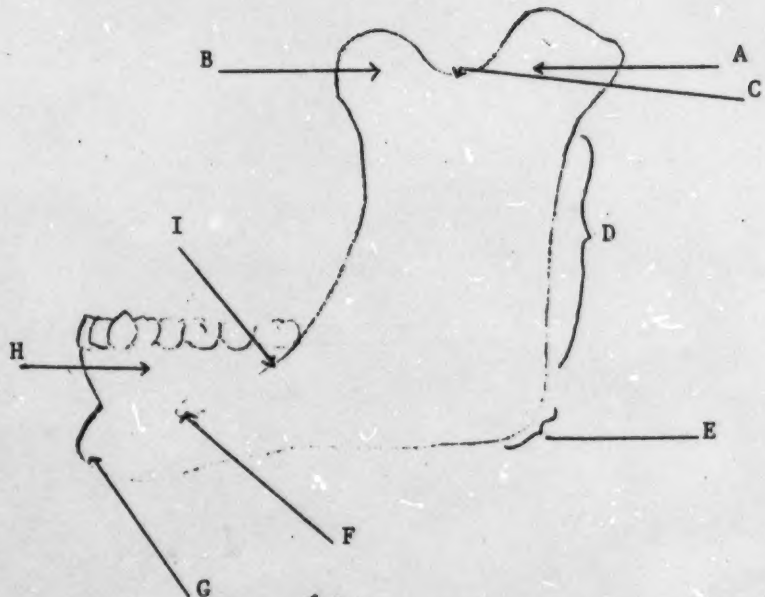
1. Name the muscles of mastication and functions:
 - 1.
 - 2.
 - 3.
 - 4.
2. Name the three large salivary glands and give their locations:
 - 1.
 - 2.
 - 3.
3. Give the functions of saliva:
 - 1.
 - 2.
 - 3.
4. The two enzymes present in saliva are:
 1. _____ and 2. _____
5. Minute glands found all over the (type of tissue) _____ of the mouth also contribute to the formation of saliva.
6. The ducts from the mandibular (sub) gland and the sublingual gland enter the mouth (location): _____
7. The _____ carries saliva to the mouth from the parotid gland.
8. Name the three sinuses:
 - 1.
 - 2.
 - 3.
9. What are the functions of the mandible:
 - 1.
 - 2.
 - 3.
10. List the functions of the maxilla:
 - 1.
 - 2.
 - 3.
 - 4.

11. Define

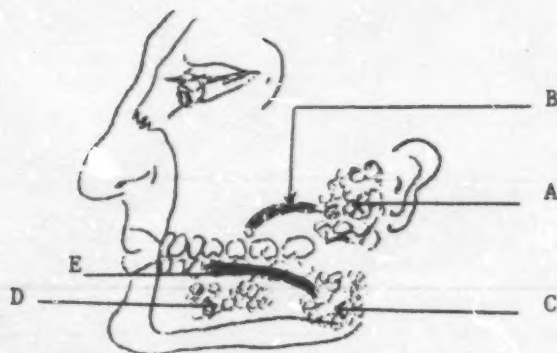
- a. mastication:
- b. muscle tonus:
- c. foramen:
- d. gingivae:
- e. zygomatic arch:
- f. muco-buccal fold:
- g. temporomandibular joint:
- h. genial tubercle:
- i. uvula:
- j. alveolar process:
- k. buccal mucosa:
- l. frenum:
- m. geniohyoid:
- n. alveolar mucosa:

12. Label the following diagrams:

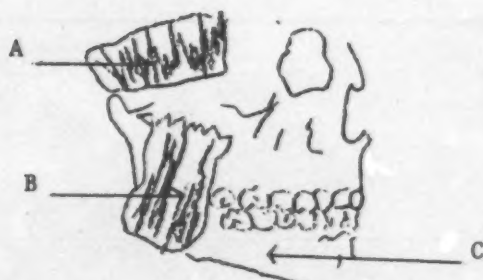
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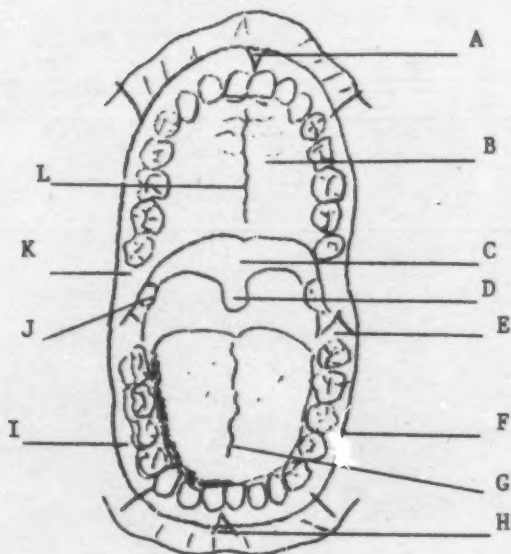
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K.
L.

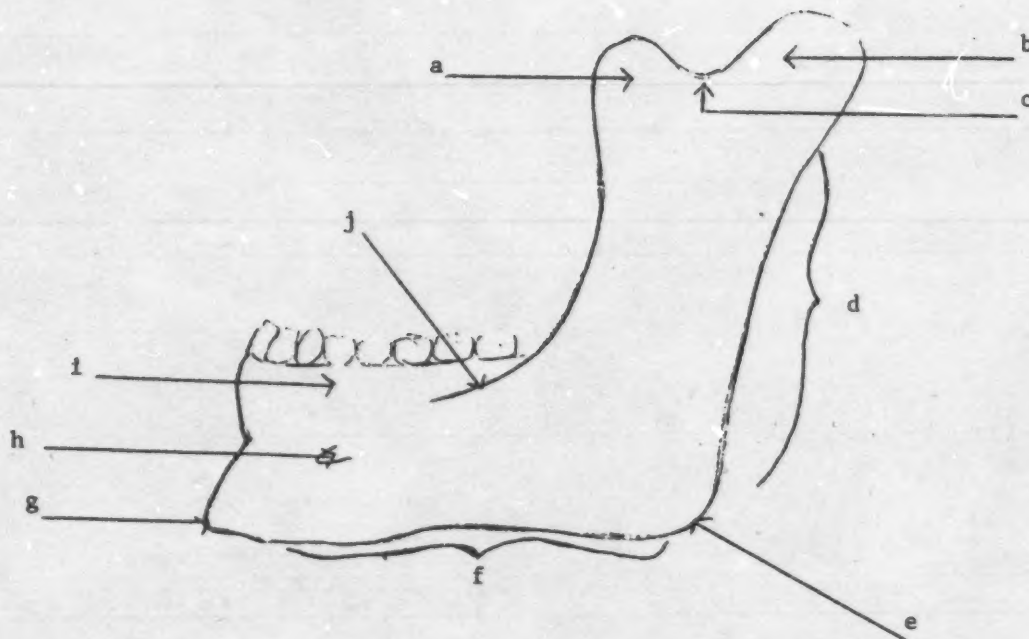


A.
B.
C.



MANDIBLE QUIZ

NAME:



a.

e.

h.

b.

f.

i.

c.

g.

j.

d.

Define the following terms:

1. process:

2. fossa:

3. foramen:

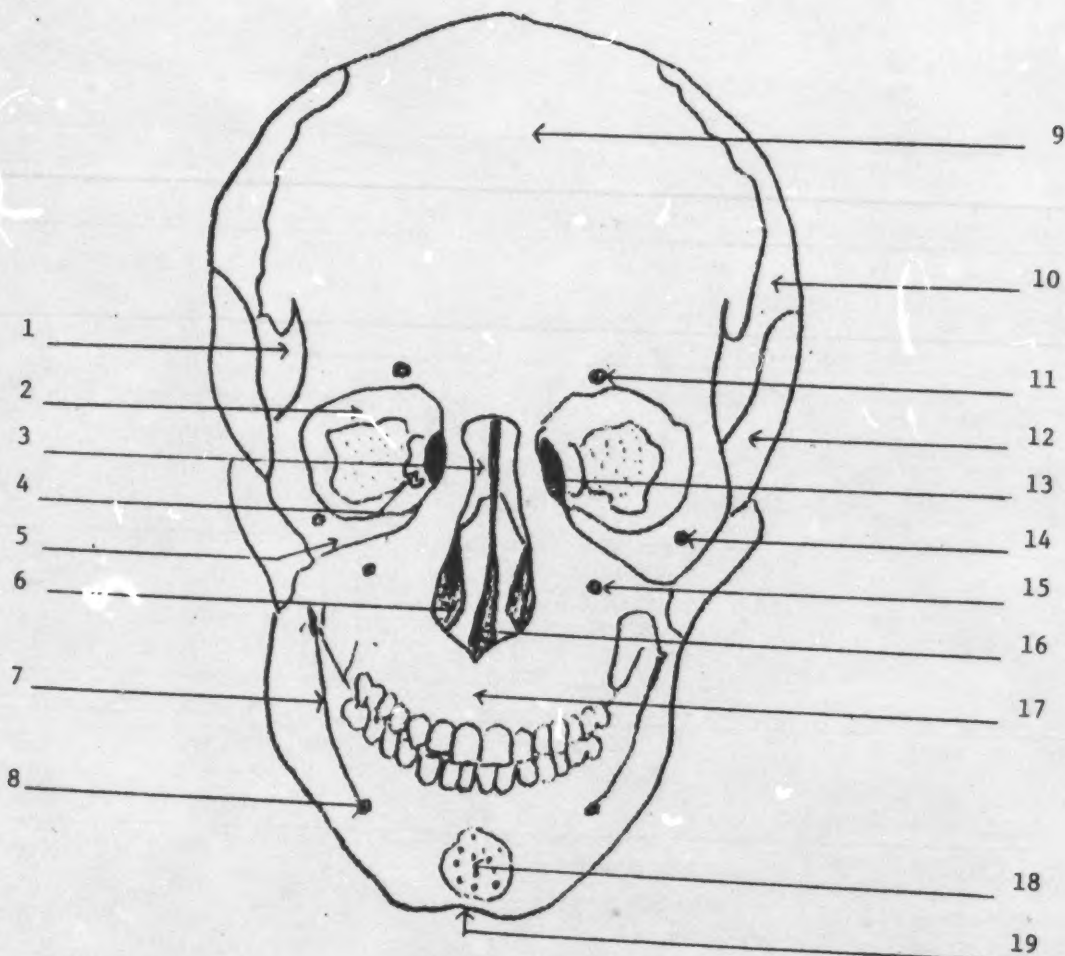
4. ramus:

5. condyle:

6. alveoli:

NAME: _____

Skull Quiz



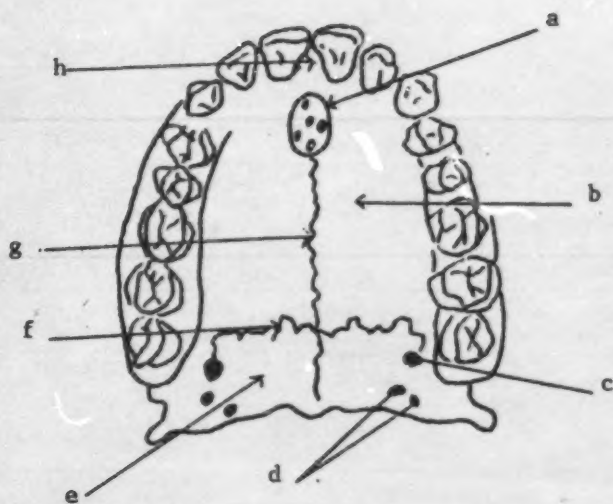
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____

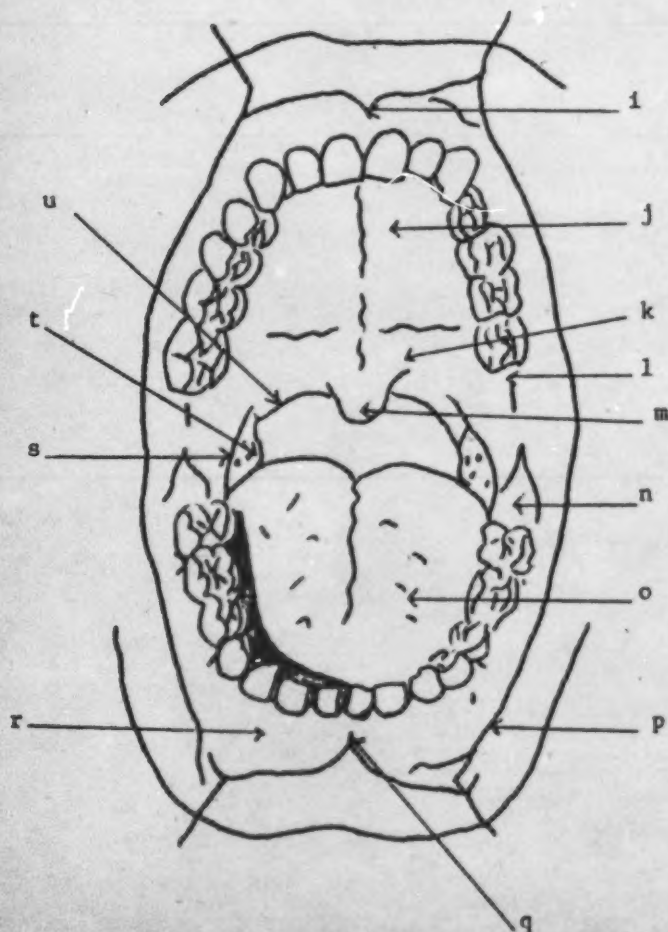
19. _____

Oral Cavity

Name:
Dental Anatomy

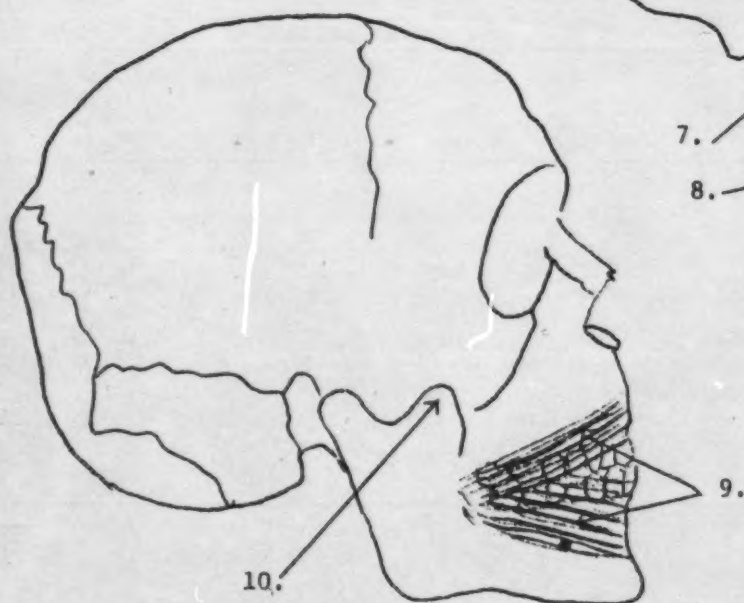
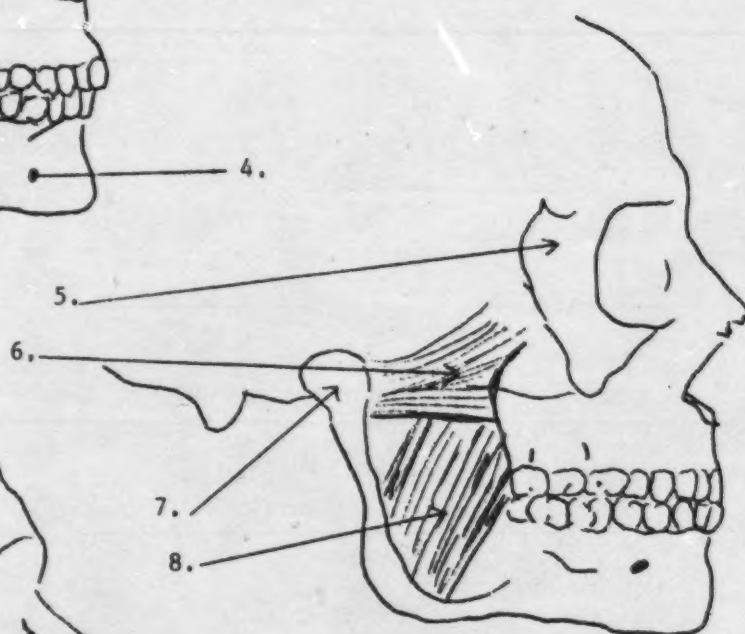
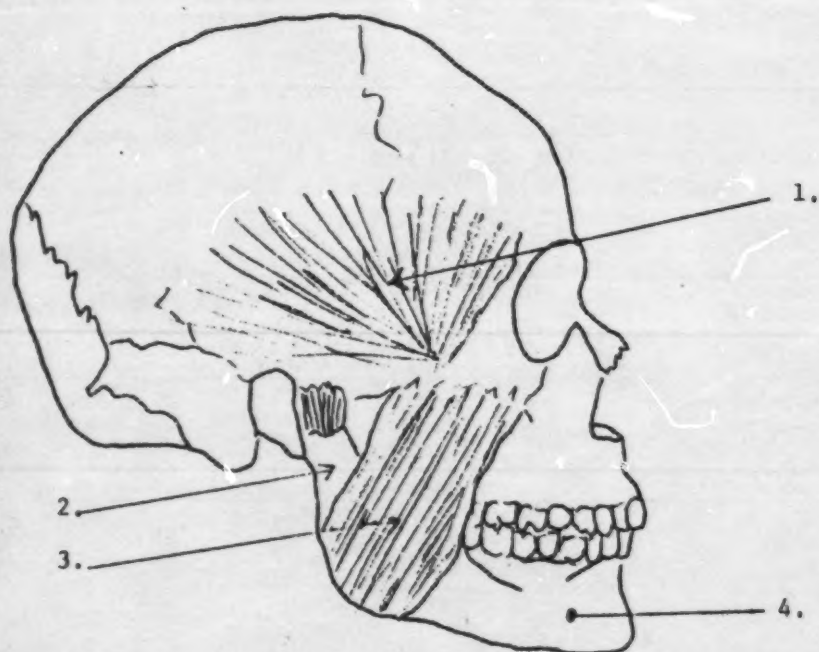


a.
b.
c.
d.
e.
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g.
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i.
j.
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l.
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o.
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q.
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u.

97
MUSCLES OF MASTICATION

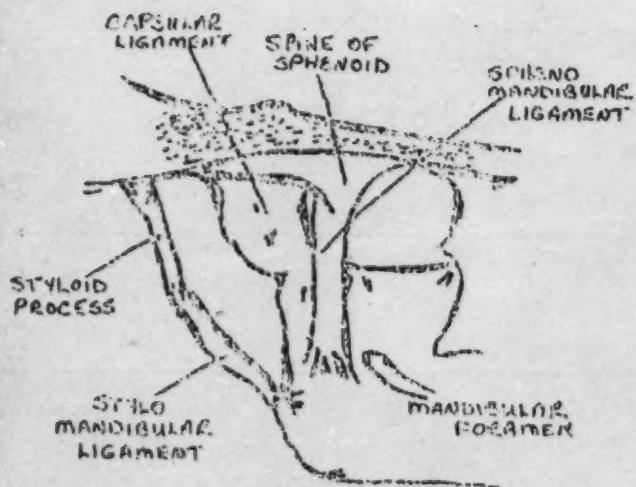
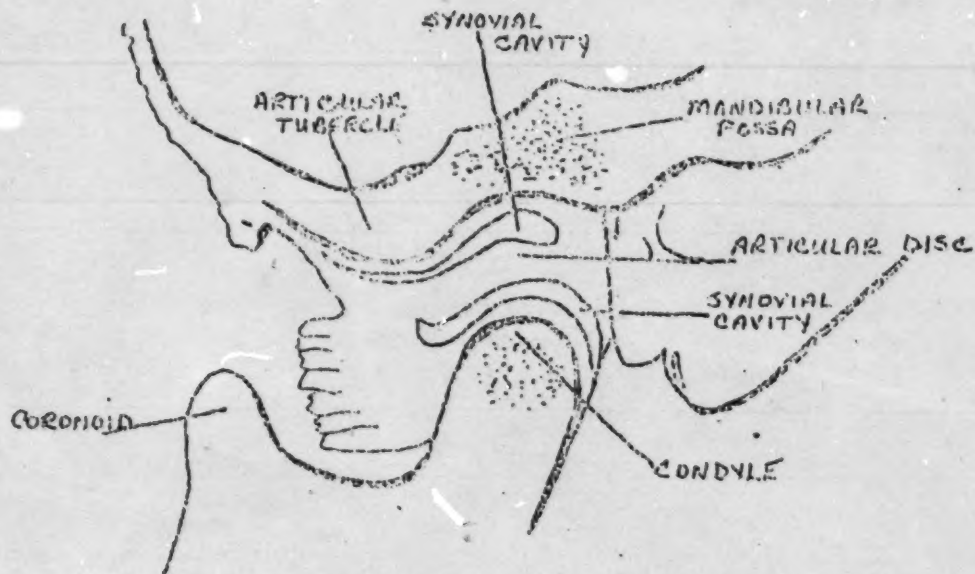


- 1.
- 2.
- 3.
- 4.
- 5.

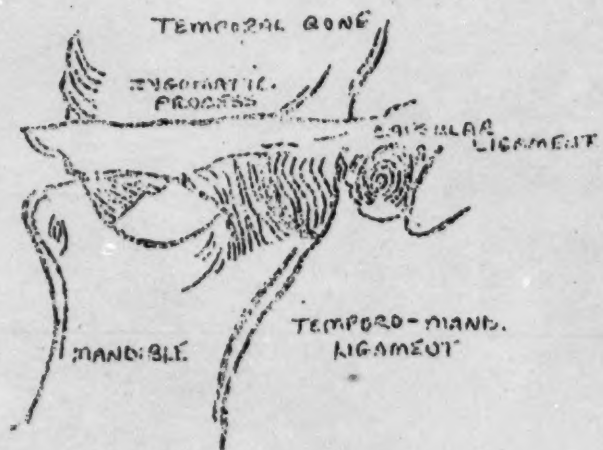
- 6.
- 7.
- 8.
- 9.

DENTAL ANATOMY TEMPORO-MANDIBULAR JOINT

DENTAL ASSISTING INFORMATION SHEET

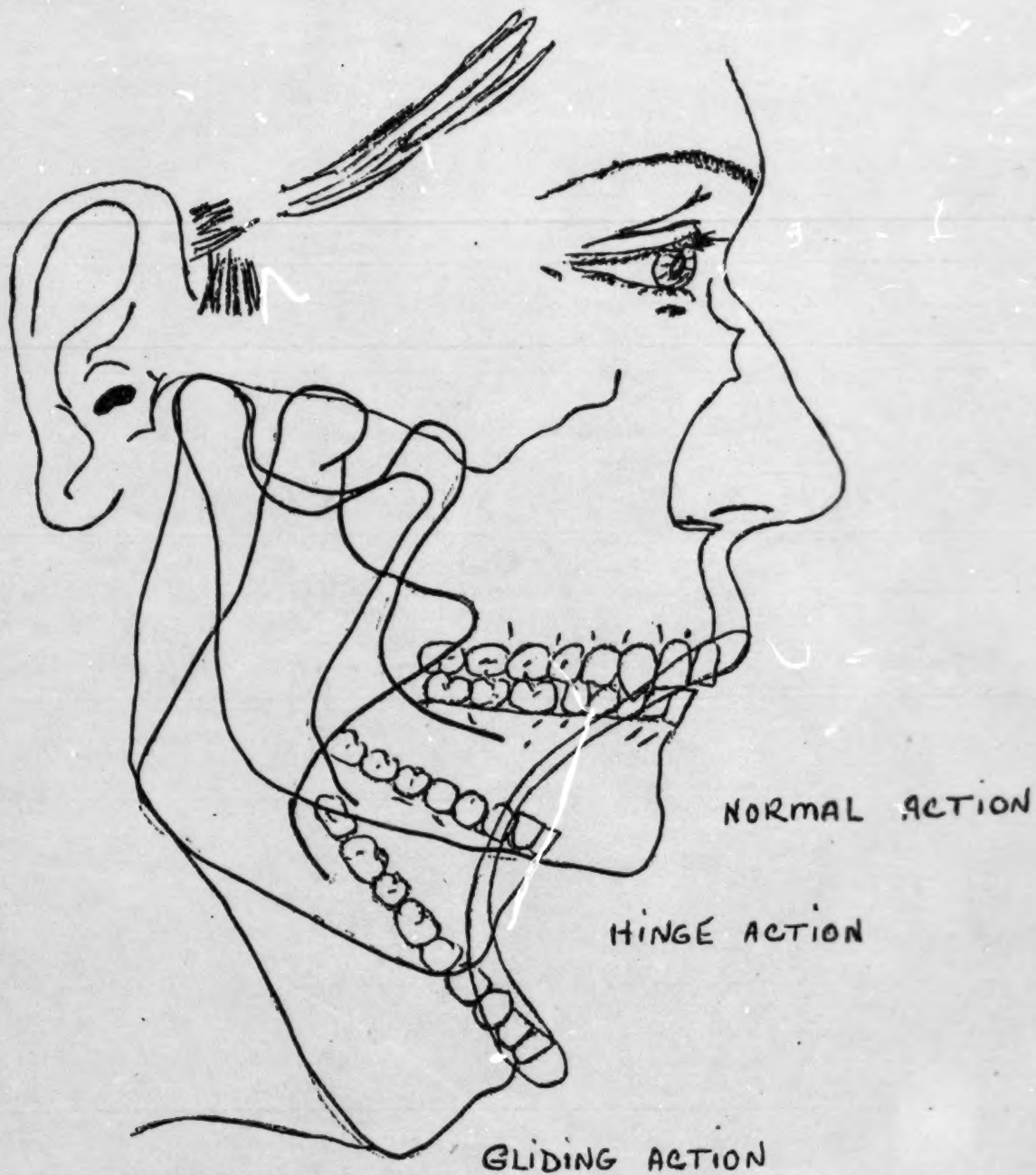


MEDIAL VIEW - T.M. JOINT

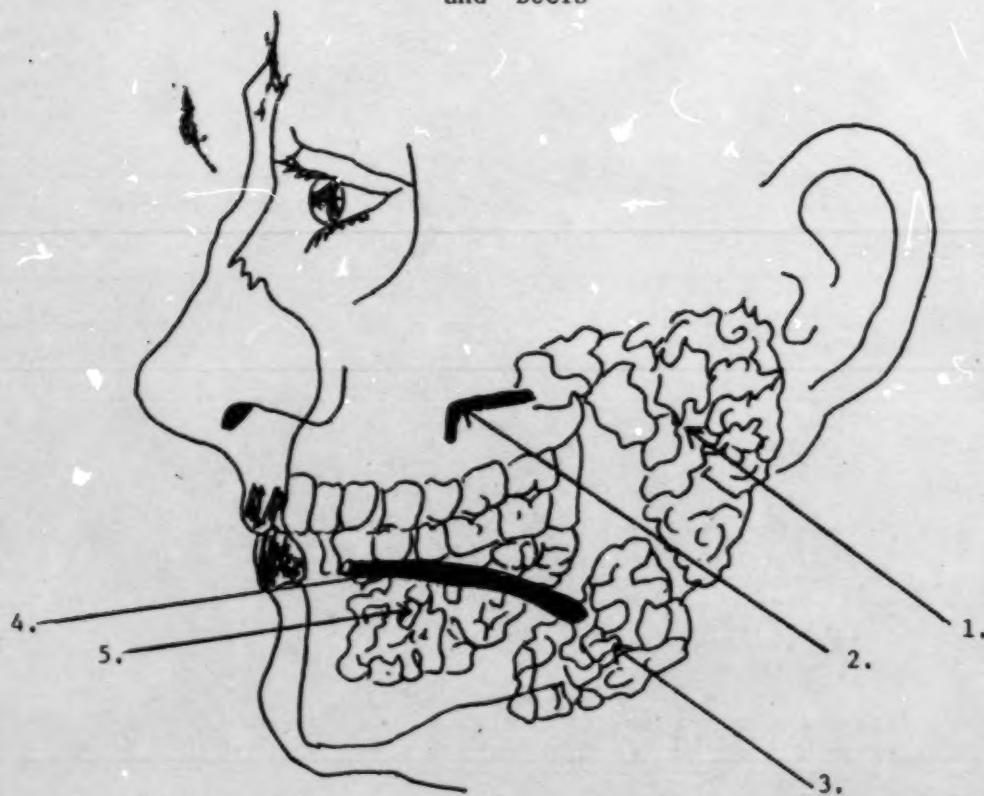


LATERAL VIEW - T.M. JOINT

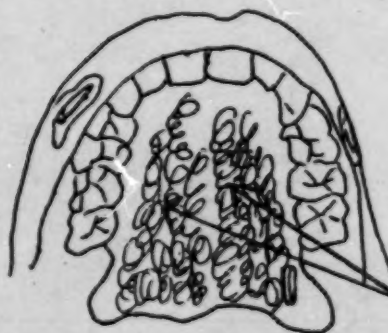
ACTIONS OF THE TEMPOROMANDIBULAR JOINT



SALIVARY GLANDS and DUCTS



6. VIEW: inside of the
lips

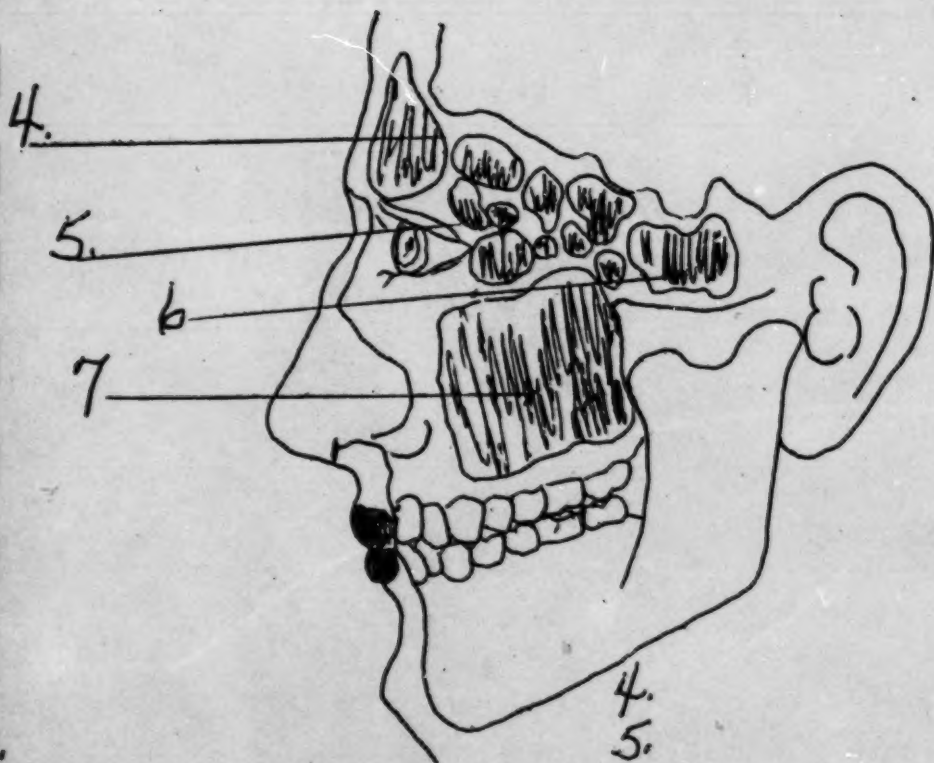
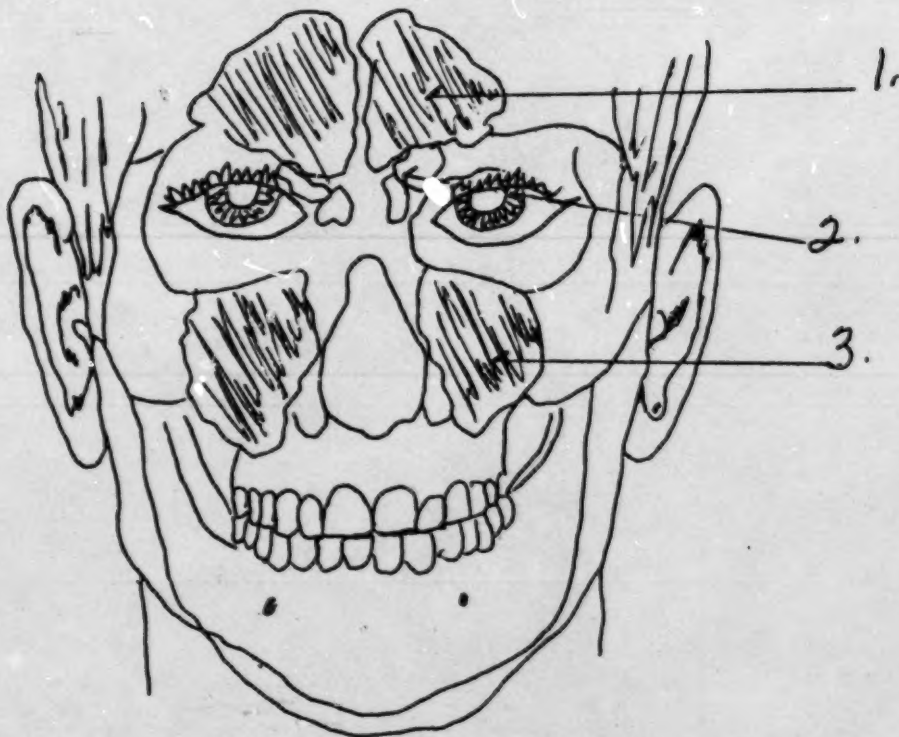


7. VIEW: palate
(roof of mouth)

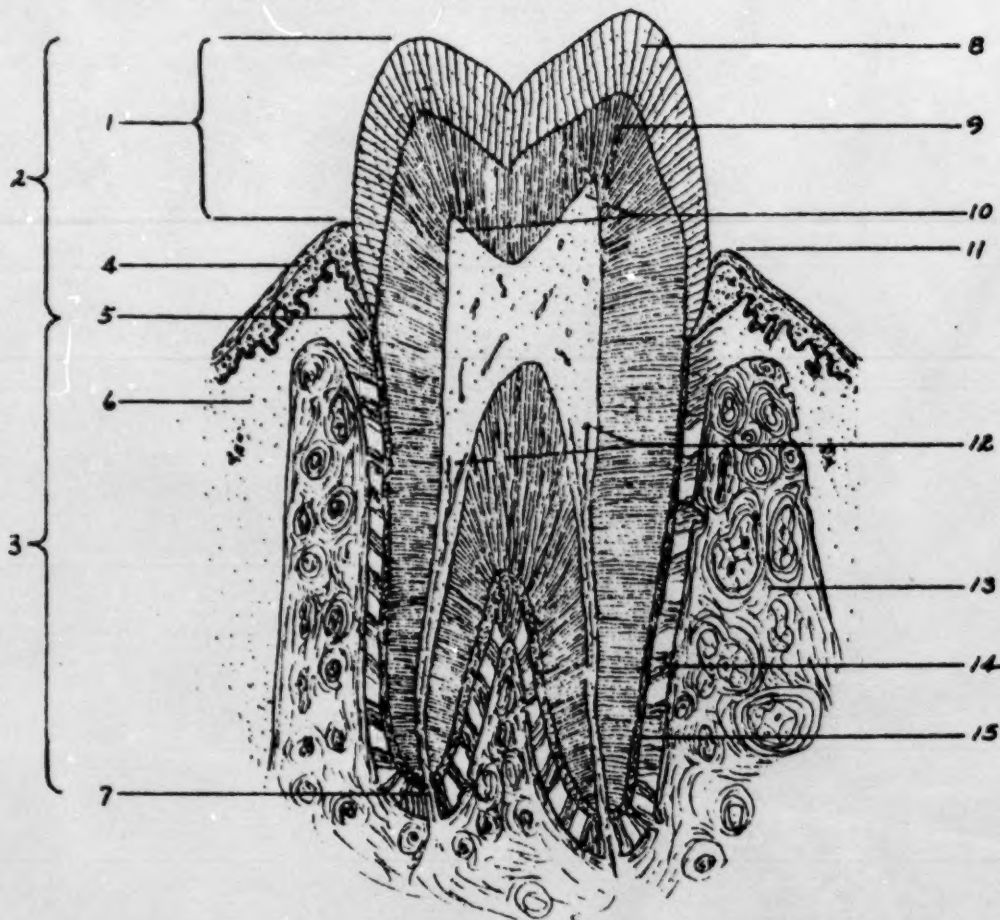
- 1.
- 2.
- 3.
- 4.

- 5.
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SINUSES

4.
5.
6.
7.

DENTAL DRILLS



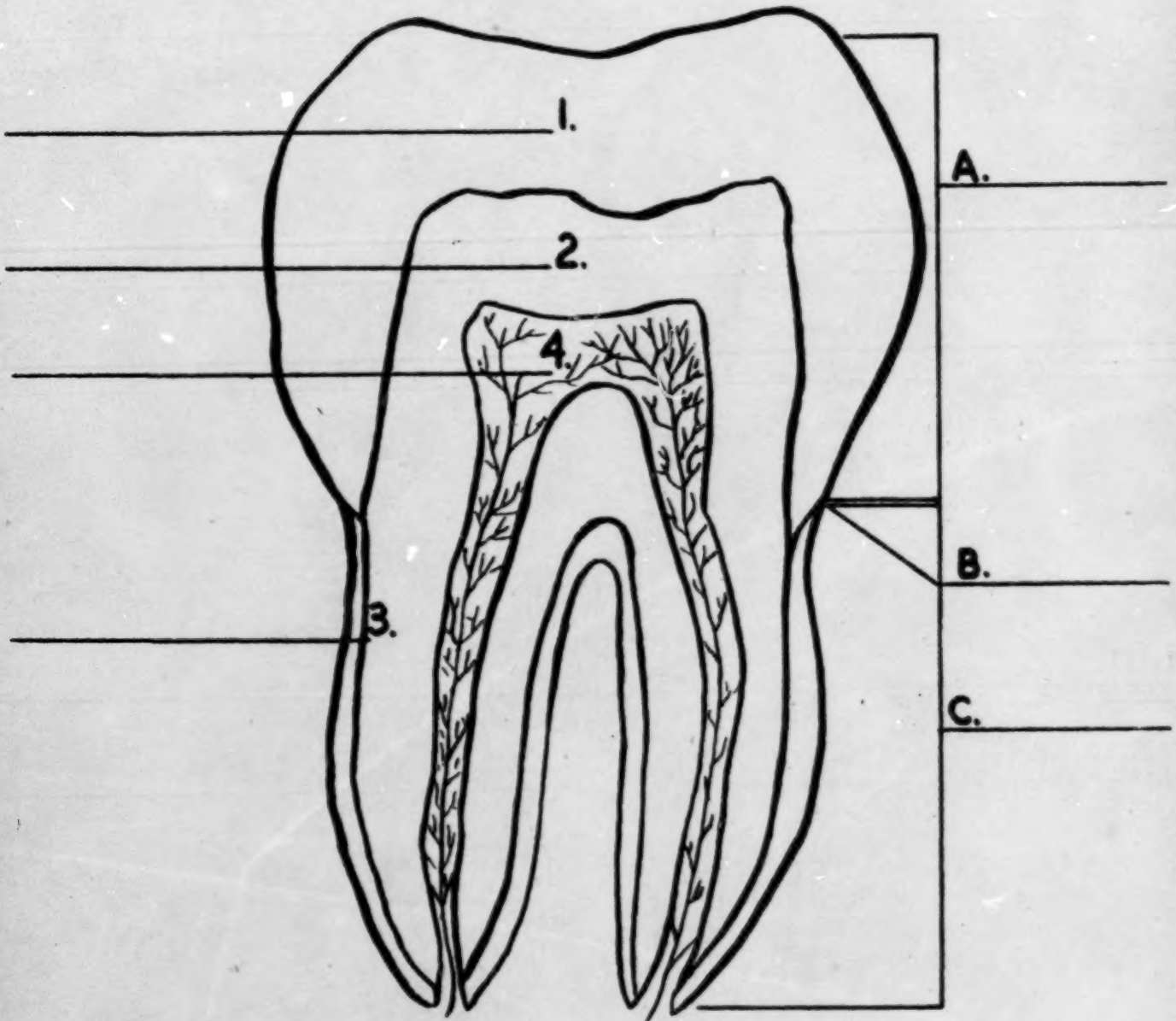
Tooth Structure

Tooth Morphology Quiz

Match the numbers and terms:

- | | |
|-----------------------------------|--|
| (a) _____ alveolar bone | (i) _____ submucosa |
| (b) _____ apical foramen | (j) _____ anatomical root |
| (c) _____ pulp horns | (k) _____ enamel |
| (d) _____ gingival crest | (l) _____ blood vessels, nerves & lymph |
| (e) _____ dentin | (m) _____ cementum |
| (f) _____ clinical crown | (n) _____ lamina dura |
| (g) _____ gingiva | (o) _____ Sharpey's fibers, periodontal ligament |
| (h) _____ cemento-enamel junction | (p) _____ anatomical crown |

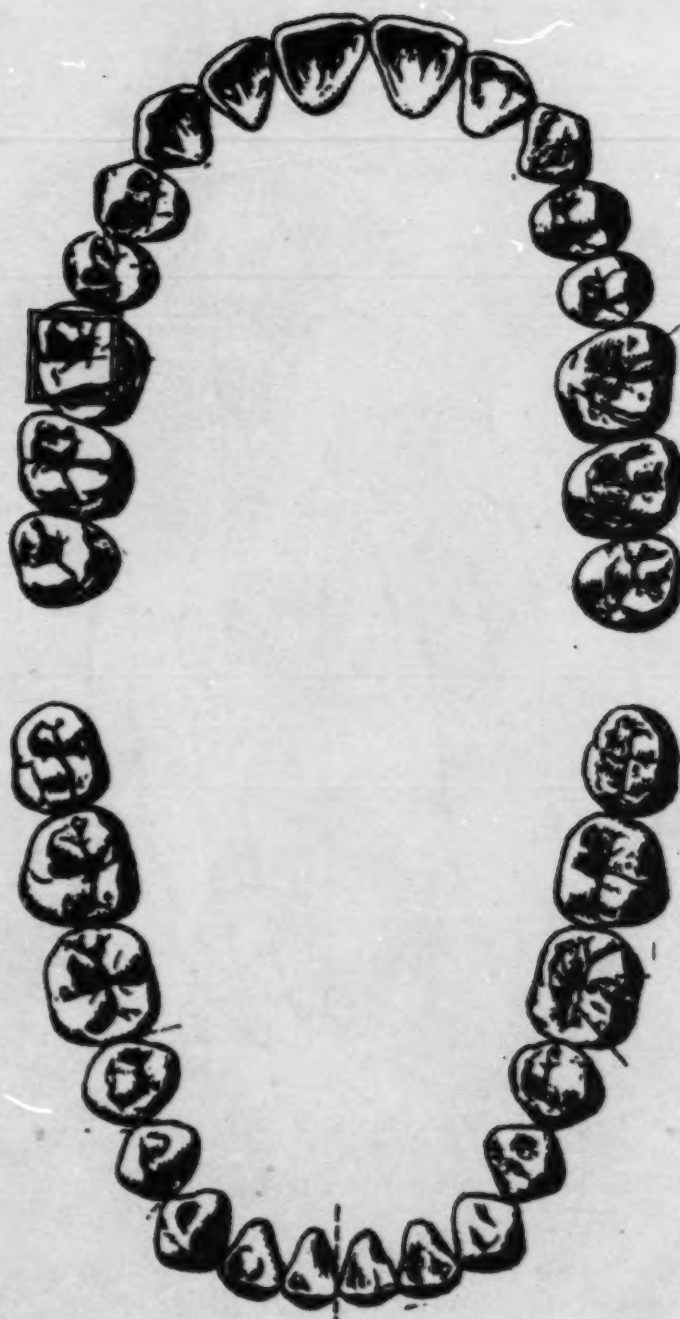
THE PARTS OF A TOOTH



EACH TOOTH HAS THREE MAIN PARTS;

(A) THE CROWN, (B) THE NECK, AND (C) THE ROOT.

This tooth is a _____. The hardest part is the (1) _____. It covers the (A) _____ of the tooth. The substance below the enamel is known as (2) _____. The (3) _____ covers the root of the tooth. The center of the tooth which is filled with blood vessels and nerves is called the (4) _____. The tooth gets its nourishment through the blood vessels.



CHARTING

As part of the process of recording the medical and dental history of a patient, a clinical chart of the mouth and teeth is made. There are a great many methods for preparation of these records in use today. The differences between charting methods arise principally because of the separate end uses to which these records are directed. Most dental offices require that the patient's chart be a diagrammatic image of the patient's mouth.

It is important that dental auxiliaries understand the nature of dental charts and be able to prepare them effectively upon the dictation of the doctor and be able to read the charts that have been prepared by others. When the dental assistant is employed in a particular dental office she will be instructed in the specific charting procedure in use in that office.

All dental charts have anatomical parts of the teeth and mouth represented by line drawings, sketches, and diagrams.

The charts used in this manual are actually constructed so that by crossing out either "Right" or "Left" in the appropriate areas, and indicating the teeth by number and/or letters, any system of charting can be used.

CHARTING

Dental Assisting

All restorations which are fixed into or onto the teeth are drawn as nearly as possible the way they appear in the tooth insofar as the surfaces involved. All previous dentistry in the patient's mouth at the time of examination is charted with red pencil. All defective restorations, carious lesions, and clinically indicated extractions are recorded using a black lead pencil and drawing the defect in outline only.

All treatment services which are completed by the dentist in accordance with his treatment plan are filled in on the chart by overwriting everything else with ink. Treatments in progress but not yet completed are overwritten in outline form only with ink and then filled in upon completion of the service. Several dentists in a group practice may then identify the services each produces for a patient by recording on the clinical chart and on the ledger in different colored inks.

Amalgam restorations are filled in solidly--in red pencil, if previously placed--in ink if presently performed. An amalgam restoration which has been condemned for replacement would be indicated in solid red appropriately located on the proper tooth surface and in proper form. It would then be outlined in black pencil. When replaced it would be filled in ink overwriting both the red pencil and black pencil outline.

All silicate or plastic restorations are indicated in "outline" form only. They are noted in red--if previous--or in pencil if condemned. They are filled in by "dotting" in ink when replaced. blue ink if presently performed.

All gold restorations are indicated by first outlining the form of the restoration in its proper place on the tooth surfaces involved and then striping the interior of the outlined surface. If the restoration is a single gold restoration in a single tooth it is striped "Horizontally". If it is a retainer, pontic, or part of a fixed bridge it would be striped "obliquely" including all combined parts of the bridge in the same striping. This type of striping would be used both in red pencil; if previously placed; and blue ink if presently placed. The entire bridge would be outlined in pencil if condemned for replacement. The bridge would be outlined, but not striped in ink if the abutments had been prepared but the bridge had not yet been seated.

Teeth to be extracted are condemned by drawing two vertical parallel lines through the tooth picture on the chart. When the extraction has been accomplished the two vertical lines would be overwritten in ink. Teeth which had been previously extracted or are clinically missing would be indicated by crossing a small "X" through the tooth number or letter. If the tooth is clinically impacted it would be shown in double red pencil curved lines around the tooth picture. If the impacted extraction was to be undertaken by the dentist the red lines would be overwritten in black pencil. If the extraction had been performed, it would be overwritten in ink.

Porcelain jacket crowns and plastic jackets are indicated by open outlines around the crown of the tooth. Facings for veneer crowns and pontics are outlined and left open while the metal portion is appropriately striped.

Stainless steel crowns and gold crowns containing precision attachment devices for retaining partial dentures are outlined open and vertically striped.

Periodontal disease and bone destruction is outlined over the root surfaces of the tooth presentations. Root canal fillings are drawn into the tooth. Periapical destruction may be indicated at the root ends. Non-vital mobile teeth, and drifted teeth, are noted in the boxes underneath the charting diagram.

All removable appliances are described in essay form under "Remarks" attached to the chart. Such appliances are described as to materials used, teeth replaced, teeth clasped, location of bars, saddles, connectors, and a statement as to serviceability.

The patient's chart is expected to serve as a reminder of the oral condition of the patient throughout the patient's treatment and even for many years of maintenance of the patient's dental health. The patient's chart is a legal record and may be subpoenaed in court. Many, many, court cases have been determined just on the material recorded on a patient's chart. The dental chart is always a valuable aid for identification of persons burned or mutilated in accidents and war. The chart should be prepared very carefully and kept up to date as a running history of the patient's dental experience.

Such notes, abbreviations, symbols, and drawings as are necessary to point out the clinical circumstance should be used. Question marks may be placed between teeth where caries are suspected or where some diagnostic doubt exists. "TS" may indicate "Temporarily Serviceable" "RC" may mean "Root Canal", etc.

CHARTING

Dental Assisting

It must be understood that charting methods vary from office to office. The material furnished here may be adapted to any of the systems in use. Recently the American Dental Association and the National Association of Dental Schools endorsed a single method of tooth designation. This method labels the teeth with numbers from 1 to 32, starting on the upper right 3rd molar to the upper left 3rd molar; 1-16 from the lower left 3rd molar to the lower right 3rd molar.

When communicating with another office or doctor it is wise to use the correct anatomical description of any tooth such as "upper left first molar" rather than the designation used in your office. Conversely when you receive any communication indicating a tooth by letter or number if you are not absolutely sure of the designation, ask the caller or writer exactly which tooth he is talking about.

CHARTING
INFORMATION SHEET

DEFECTS - PENCIL

PREVIOUS DENTISTRY - RED

PRESENT WORK - BLUE

I. DEFECTS - pencil:

a) dental caries - outline shape only 

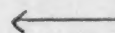
b) impactions - two curved lines around sides of the tooth drawing 

c) teeth to be extracted - two parallel lines through the tooth drawing 

d) drifting - mesial



drifting - distal



e) extruding -



f) periapical abscess - circle at the apex



g) temporary serviceable - TS

h) temporary restoration or treatment restoration - outline and dot



i) missing - small x



j) fracture - jagged line



II. RULE FOR CHARTING:

Unless it is stated occlusal or lingual, draw the symbol on the facial line.

Cap on an anterior tooth - jacket

Cap on a posterior tooth - crown

Jackets and crowns are usually made of gold cause its stronger, put a porcelain facing on the facial surface of the tooth.

1) amalgam - outline and fill in solid (red/blue)

2) tooth colored - outline only (red/blue)

3) defects - outline only (pencil)

4) gold - stripped (red/blue)

Guide to Charting

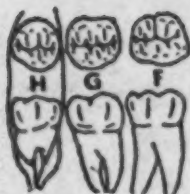
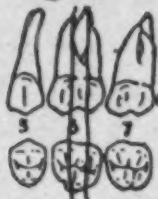
Existing Conditions
Previous Dentistry-----Red

Work Completed-----Ink (Blue

Missing Teeth



To Be Extracted



Impaction



Porcelain Jacket
Outline Tooth



Root Canal



Silicate
Outline



Work To Be Done-----Pencil

Serviceable Restorations-----TS

Three Quarter Crown
Horizontal Stripped



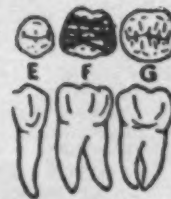
Full Gold Crown



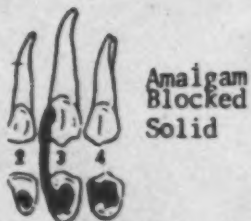
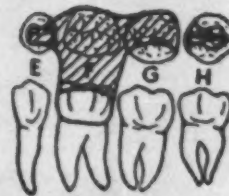
Gold Crown
Porcelain Facing



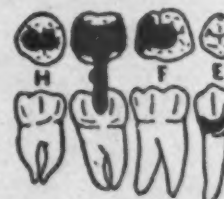
Gold MOD

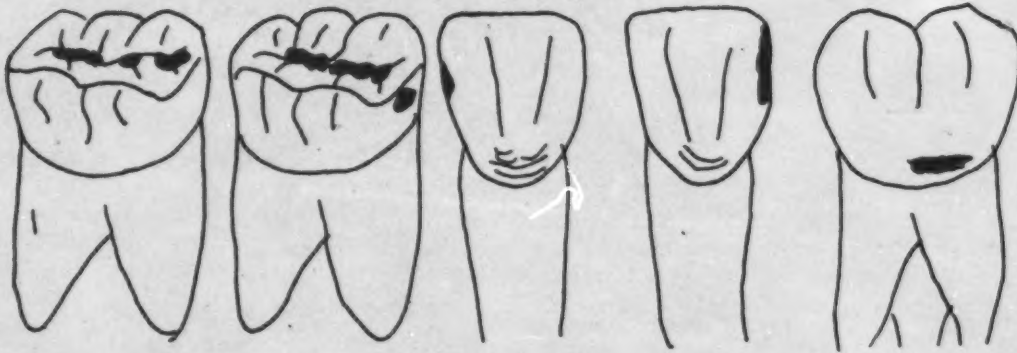


Bridge
Oblique Stripped

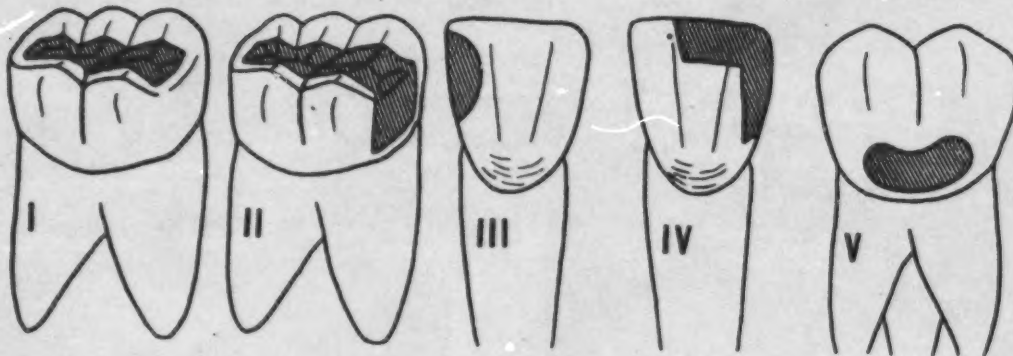


Amalgam
Blocked
Solid

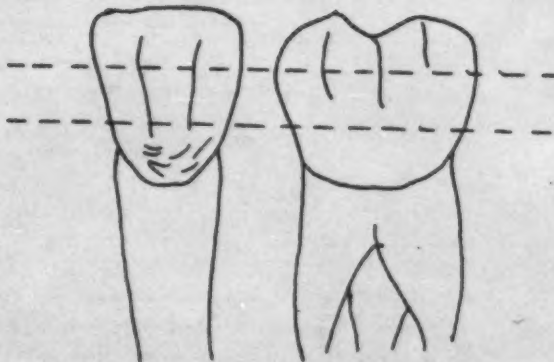


Cavity Classification

CARIES



RESTORATIONS



INCISAL OR OCCLUSAL 1/3

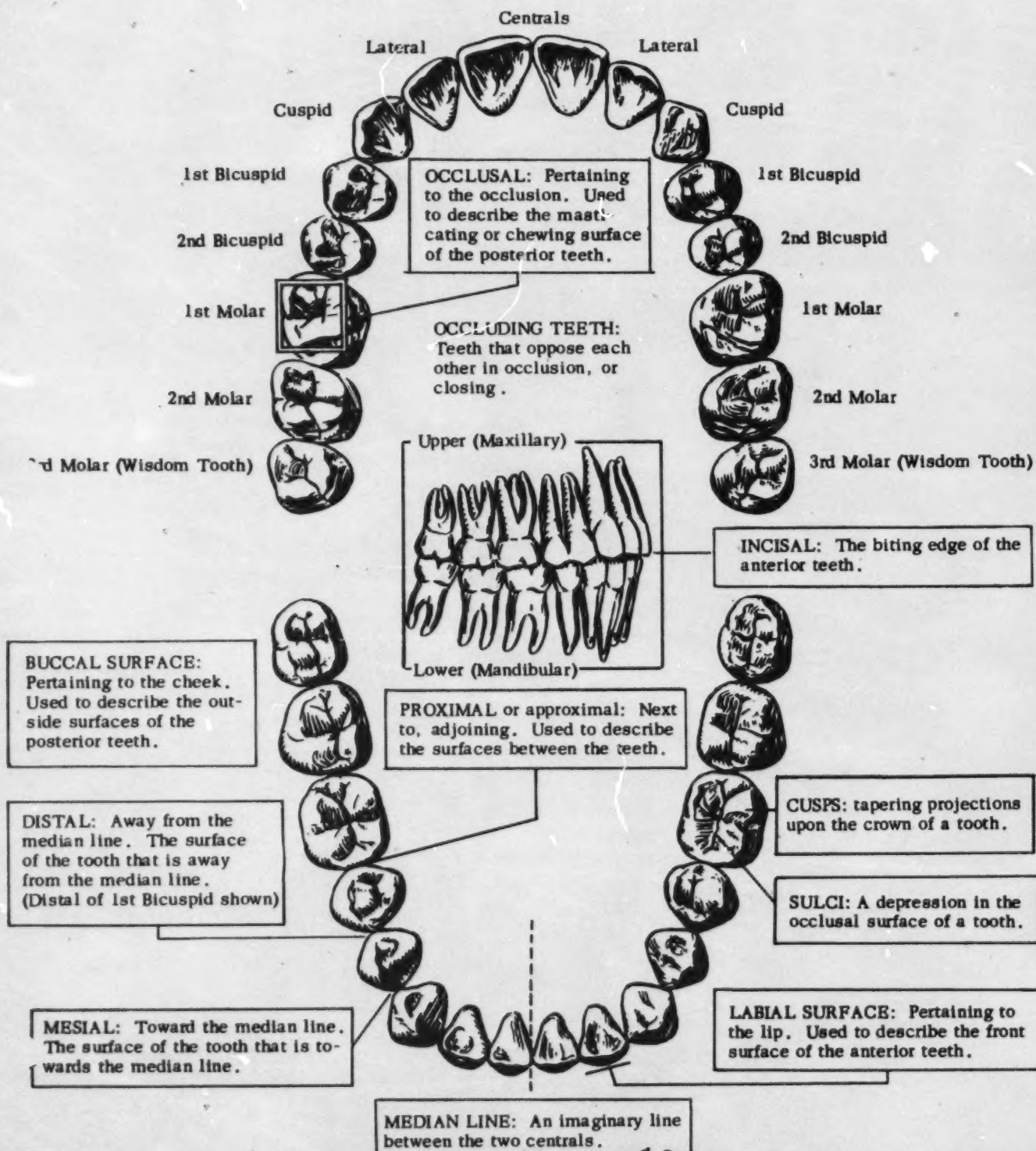
MIDDLE 1/3

CERVICAL 1/3 (Gingival)

CONCERNING NATURAL TEETH

There are 32 natural teeth. Roots are imbedded in bone called the alveolar process or ridge. The upper jaw, or maxilla, is stationary and attached to the other bones of the head. The lower jaw or mandible is movable. In each jaw there are six anteriors (front teeth) and ten posteriors. The anteriors have a single root, and are classified as centrals, laterals and cuspids. The posteriors have two or more roots and are classified as bicusps and molars.

IDENTIFICATION OF TEETH AND TOOTH SURFACES



TOOTH SURFACES (Continued)

FISSURE; the groove at the bottom of the sulci.

CERVICAL; pertaining to the cervex or neck of the tooth. The cervex is the portion of the tooth between the crown and the root - gingival.

INTERDENTAL SPACES; the wedge shape spaces between the teeth from the top of the ridge to the contact points between adjoining teeth.

CONTACT POINT; the spot on the proximal surface of the tooth where the tooth contacts the adjoining tooth.

TERMS DESCRIBING CAVITIES AND RESTORATIONS IN THE CAVITIES

M.O. - Mesial and Occlusal

D.O. - Distal and Occlusal

M.O.D. - Mesial, Occlusal and Distal

M.I. - Mesial and Incisal

M.I.D. - Mesial, Incisal and Distal

M.L. - Mesial and Labial

D.L. - Distal and Labial

L.O. - Lingual and Occlusal

B.O. - Buccal and Occlusal

L.G. - Labial and Gingival

M.Lin. - Mesial and Lingual

D.Lin. - Distal and Lingual

A cervical cavity is located at the gum line. A buccal cavity is located on the cheek side of a posterior tooth. A fissure cavity is located in the fissures in the occlusal surfaces of bicuspid or molar teeth.

COMPOSITION OF A TOOTH

ENAMEL; the outer covering of natural teeth. A white, compact and hard substance which protects the dentine of the crown of natural teeth.

DENTINE; the chief substance or tissue of the teeth. Surrounds the tooth pulp. Covered by enamel on the exposed part of the tooth and by cementum on the part implanted in the jaw.

PULP; a soft tissue that occupies the pulp chamber and the root canals of a tooth. Composed of nerves, blood vessels and connective tissue.

CEMENTUM; the layer of bony tissue covering the root of a tooth.

PERIODONTAL MEMBRANE; fibre tissue that connects the cementum of the tooth to the surrounding structure.

LAMINA DURA; thin, hard bone lining the tooth socket.

APEX; end of the root.

APICAL FORAMEN; opening at the end of the root through which the blood and nerve supply enters the tooth.

BIFURCATION; separation of the roots in bicuspid and molars.

DEFINITIONS YOU SHOULD KNOW
Specialties of Dentistry

DENTISTRY; (dentistre) The specialty of medicine concerned with the teeth and oral cavity. 2. The work of dentists, such as fillings, crowns and bridges. 3. The dental profession collectively.

OPERATIVE D.; deals with preparation of teeth for receiving of crowns or fillings.

PREVENTIVE D.; deals with preventing dental and oral disease.

PROSTHETIC D.; art of making dental appliances and restorations.

DEFINITIONS (Continued)

EXODONTIA; (ex-o-don-she-ah) extraction of teeth. Exodontist is a specialist in the extraction of teeth.

PEDODONTIA; (pe-do-don-she-ah) The department of dentistry which deals with the teeth and mouth conditions of children.

PERIODONTIA; (per-e-o-don-she-ah) deals with the science and treatment of diseases and conditions that occur around the tooth.

ORTHODONTIA; (or-tho-don-she-ah) deals with the prevention and correction of irregularities of the teeth and malocclusion.

PROSTHETIC TERMS

DENTURE; (dent-chur) an artificial set of teeth.

FULL D.; an appliance restoring or replacing the full number of teeth in one or both jaws.

PARTIAL D.; an appliance supporting less than the full number of teeth in one jaw.

IMMEDIATE D.; an appliance or artificial denture that is inserted immediately after extraction and before the tissues have completely healed.

CLASP D.; a partial denture attached to the supporting teeth by clasps.

REMOVABLE D.; any denture that can be removed by the patient.

BRIDGE; a partial denture supported and held in position by attachments to the adjacent teeth.

FIXED B.; a dental bridge permanently fixed to abutments with inlays or crowns. A fixed bridge cannot be removed by the patient.

REMOVABLE B.; a bridge that can be removed and replaced with ease by patient.

SADDLE B.; a bridge which is supported by the alveolar ridge.

SANITARY B.; a bridge in which there is a space between the bridge and the gums so that space may be readily cleansed.

CANTILEVER or FIXED-MOVABLE B.; a bridge that is attached at one end to a natural tooth or root, the other end resting unattached in a depression in a tooth.

EXTENSION B.; a bridge having a pontic attached at one end beyond the point of anchorage of the bridge itself.

MOVABLE, REMOVABLE B.; a bridge that is attached to the abutment teeth by means of precision formed attachments instead of clasps.

INLAY; (in-la) a cast filling that is made to correspond with the form of a cavity and then cemented into the cavity. Inlays may be made of gold alloys and porcelain. Acrylic inlays are not generally satisfactory. Porcelain and acrylic inlays are not sufficiently strong to serve as abutments for bridgework.

FILLING; (fil-ing) the material that is inserted in the prepared cavity in the tooth. Fillings may be made of amalgam, gold foil and synthetic porcelain. Temporary fillings are made of cement and gutta-percha. A contour filling restores the original shape of a tooth crown and occlusal anatomy.

ONLAY; an inlay that is built upon the occlusal or incisal edges of the tooth. Often used to restore lost tooth structure and to increase the height of the tooth.

CROWN; the portion of the tooth which projects above the tissue in which the root is fixed. Artificial c.; a restoration to replace all or part of the crown of a natural tooth. Artificial crowns may be constructed of gold, porcelain or acrylic.

VENEER C.; a gold crown, the face of which is covered with a porcelain or acrylic shell.

CARMICHAEL C.; a partial gold crown that covers the lingual, proximal and occlusal or incisal surfaces, but not the labial or buccal.

OPEN FACE C.; a crown that is attached by a metal band to the remaining structure of a tooth. (Continued on next page)

The metal covers the lingual surface, and the incisal and gingival on the labial, exposing a portion of the labial surface of the tooth.

THIMBLE C.; a porcelain or acrylic crown or jacket that is placed over a gold casting or platinum shell that is attached to the remains of a natural tooth. The thimble crown is often preferred as an esthetic abutment. Thimble crowns are indicated when tooth structure is so destroyed that it must be built up in order to carry a porcelain or acrylic jacket.

OBTURATOR; (ob-tu-ra-tor) an artificial appliance which closes an opening in the palate, prescribed for patients with cleft palates.

SPLINT; a rigid or flexible appliance for fixation of displaced or movable parts - Broken jaws.

ANGLE S.; a wire splint for fastening the lower teeth to the upper ones in fracture of the mandible. The wires are held in place by bands cemented to the teeth.

INTERDENTAL S.; a splint for fracture of the jaw. Held in place by wires passed around the teeth.

ORTHODONTIC appliances are essentially splints that are designed to straighten irregular teeth.

GENERAL TERMINOLOGY

ABRASIVE; a substance with sharp particles that is used to smooth and polish a rough surface.

ABUTMENT; a tooth used to retain, hold or carry a bridge; natural tooth to which a fixed or removable bridge is attached.

ADHESIVE; sticky. Wax is adhesive.

AGAR-AGAR; a mucilaginous substance made from sea weed. Used as an impression or duplicating material - Hydro-colloid.

ALVEOLAR TISSUE; the gum structure that covers the ridge and holds the natural teeth in position.

ALVEOLUS; tooth socket, cavity or pocket in the alveolar process in which the root of tooth is held by the periodontal membrane.

AMALGAM; a plastic, metallic alloy that contains silver, zinc, tin and mercury.

ANTEROPosterior; from front to the rear.

ANTRUM; a cavity or chamber, especially one within cheek bones.

ARCH; the term used to designate the dental arch. The arch formed by the crowns of the teeth in their normal position. **ABNORMAL A.;** a dental arch which varies from the normal. **Expansion arch;** a wire appliance made to conform to the arch of the jaw, used for moving teeth in orthodontic work. **Lingual arch;** a wire appliance made to conform to the lingual aspect of the dental arch used in orthodontic work. **Palatal arch;** the arch formed by the roof of the mouth from the teeth on one side to the other. **V-shaped arch;** an arch which comes to a point at the lingual junction of the upper central. **Zygomatic arch;** arch formed by the malar and temporal bones; the zygoma. **Gothic Arch;** a pattern that is a representation of the position of the mandible and its movement on one plane.

ARTICULATION; contact relationship of the occlusal surface of the teeth while in action. The movement into and away from the centric position by the teeth while in contact. **Adaptable or adjustable articulator;** an articulator which permits adjustment to conform with the movement of the mandible. **Average-movement articulator;** one which permits movements accepted by the originators as average. **Plain-line articulator;** one which has only a hinge joint from which no lateral movement is possible.

ARTIFICIAL STONE; a plaster like substance used for making dental casts. The base of artificial stone is a gypsum material, hydrocal.

AXIAL; pertaining to the long or vertical dimension of a tooth.

BASEPLATE; a plastic material used for making trial plates or try-ins for artificial dentures - Trubase.

BENNETT MOVEMENT; the sliding of the rotational center of the condyle laterally while the mandible is in movement. The lateral movement of the mandible is the result of the movement of the heads of the condyle along the lateral inclines of the mandibular or glenoid fossa.

BITE; imprint of the teeth or gum in wax. Used for mounting artificial dentures. Check bite; a thin sheet of wax or paraffin placed between the teeth in the mouth and used as a check for mounting the teeth on the articulator. Closed bite; when upper and lower ridges are abnormally close together. Edge-to-edge bite; closure in which the incisors of both jaws meet along their cutting edge when the jaw is closed. Over-bite; condition in which the upper incisor teeth overlap the lower ones in closure. Mush bite; the taking of a bite in one piece of wax to secure an arbitrary relationship between the upper and lower ridges. Bite rim; a rim of wax placed on the baseplate in an arch described by the teeth or the edentulous ridge. The bite rim is a guide for placing artificial teeth; (Occlusal rims). Working bite; the side of the jaw which is grinding food is said to be the working side. It may be either the right or the left side. The distance the teeth on the working side are compelled to move vertically in order to slide sideways until the buccal cusps interdigitate is termed the depth of the working side. Balancing bite; when upper and lower dentures are well articulated to prevent the dentures from being tipped out of place, the upper and lower teeth on the side not working should come into contact at the same time those on the working side do. The side not working is termed the balancing side. Incising bite; when the lower jaw is thrust straight forward in biting, the posterior teeth must maintain such relations as will prevent the dentures from becoming dislodged when the upper and lower incisors come into contact. When the upper and lower incisors are in contact, the relationship is known as the incising bite.

BOXING; the placing of a retaining wall of wax around a dental impression. The retaining wall is to hold the cast material (Artificial stone, plaster) in position until it sets hard.

BUCCO-LINGUAL; from buccal surface to lingual.

BUR; a small rotary instrument of steel for cutting tooth structure, metal and cement. Burs are operated by a dental engine or lathe.

BURNISHING; polishing by friction. Tin foil is burnished for the purpose of adapting it to the cast.

BUTTED TEETH; teeth set directly against the alveolar process. When teeth are butted, dentures do not have a labial front.

CAST; reproduction in plaster or stone of all or part of a dental arch. Model.

CLASP; a partial bend or loop of gold or another metal. Attached to the denture it is fitted to grasp the abutment tooth.

CONDYLE; the rounded eminence, or knuckle, at the upper end of the mandible, which fits into the glenoid fossa.

CONDYLAR EXCURSIONS; movements of the right and left condyles in the glenoid fossa.

CONDYLE PATH; the path followed by the condyle during opening and closing of the mandible.

CURVE of SPEE; an imaginary curve passing through the condyles and the cuspid teeth to the incisal edge of the lower centrals. Compensating curve, an imaginary line that contacts the tips of the buccal cusps of the bicusps and molars. Extends to the condyles.

DECIDUOUS TEETH; the first set of teeth in an infant.

EDENTULOUS; without teeth, toothless.

EDENTULOUS CAST; cast of the mouth without teeth.

EXTRA-ORAL; outside the mouth.

FACE BOW; an instrument designed to record the correct positional relation of the ridges of the patient for transference to the articulator. A mechanical device to record the relationship between the upper and lower ridges and the temporomandibular joints to insure reproduction of this relationship on an instrument.

FLASK; a metal cup into which a denture is invested for processing.

FLASKING; the process of investing a trial denture in plaster in a metal flask.

FORAMEN; a hole or perforation in the bone, alveolar f.; one of the openings of the posterior dental canals on the external surface of the maxillary bone. Apical f.; opening of the pulp canal at the apex of the root of a tooth. Dental f.; inferior, the outer opening of the inferior dental canal and the ramus of the mandible. Dental f.; an opening in the lower jaw for the mental nerves and vessels. Incisor f.; a Y-shaped canal at the anterior part of the inter-maxillary suture. Palatine f.; an opening in the anterior part of the roof mouth of the incisor canal. Palatine f.; posterior or great, the opening in the hard palate of the posterior palatine canal. Scarpa's f.; two openings behind central incisor teeth, which carry nasal palatine nerves (also termed incisor f. median). Stensen's, termed Stensen's duct and lateral incisor f.

FOVEA; a pit, dimple or depression.

FOVEA PALATINA; two small indentations at the junction of the hard and soft palate.

FOSSA; a shallow depression in the bone. Glenoid f.; a hollow in the plate-like or scaly portion of the temporal bone at the base of the zygoma. The condyle of the mandible rests in the glenoid fossa.

FRENUM; a fold of the mucous membrane. A fold of tissue from the lip or cheek to the alveolar ridge. Lingual f.; a vertical fold of the mucous membrane under the tongue. Labial f.; a vertical fold of the mucous membrane at the median line. Buccal f.; a vertical fold of the mucous membrane in the bicuspid area.

GUTTA-PERCHA; a sticky gum-like material obtained from the juice of various trees found in the Malayan Peninsula (temporary stopping).

GYSI; designer of 30° and 20° Posteriors and inventor of the Gysi Articulator.

HORSESHOE DENTURE; a partial upper denture from which the palate is omitted. In edentulous cases such a denture is termed a roofless denture.

IMPRESSION; the reverse or negative of the surface of any object in a plastic material.

INCISAL PIN; a pin or bar on an articulator which separates upper and lower bows in the anterior part of articulator.

INCISO-GINGIVAL; from incisal surface to gingival.

INTERDIGITATION; meshing of upper and lower cusps in occlusion.

INTERPROXIMAL SPACE; the space between the adjacent teeth covered by gum tissue.

INTRA-ORAL; within the mouth.

INVESTMENT; a material for enveloping or imbedding a cast or denture in a flask.

JUMPING THE BITE; a process of retaining the tooth relation when substituting a new denture base.

LINGUAL; pertaining to the tongue side or surface of teeth. Opposite of labial or buccal.

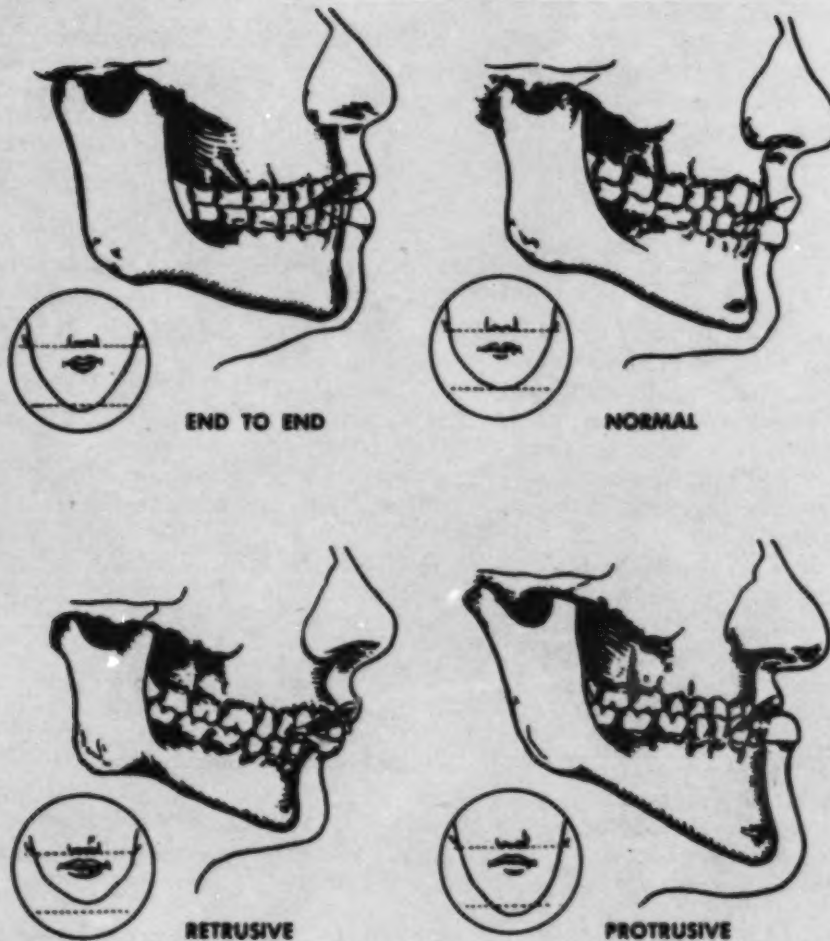
LABIO-LINGUAL; from labial surface to lingual.

LINGUAL BAR; narrow metal bar connecting saddles of partial lower denture. Located on lingual side of lower anterior teeth.

MASTICATION; the chewing of food.

MATRIX; a cast poured into a denture. The space remaining in the flask after a wax denture is eliminated and into which material for the denture is packed. Occlusal m.; index of the teeth in plaster. A plaster imprint of the teeth made for the purpose of retaining teeth in their original relationship in making new bases for old dentures.

MEMBRANE; a thin layer of tissue which covers a surface or divides a space or organ.



MUCOUS MEMBRANE; the moist pink membrane which lines the mouth, nasal cavities and alimentary canal.

MOULD; shape or form. Mould of teeth, shape of the teeth.

MOULD GUIDE; a set of forms of various sizes and shapes of artificial teeth.

MOUNTING; the arrangement of dental models on a suitable support or an instrument (articulator) for the purpose of observing and working on them.

NOTCH; an indentation or depression at the end of a bone. Pterygomaxillary n.; a depression located between the pterygoid process of the maxilla and the sphenoid bone.

OCCLUDE; to close tight. To fit together.

OCCLUSAL; pertaining to closure or occlusion. Used to describe the chewing surface of bicuspids and molar teeth.

OCCLUSION; contact of the teeth in both jaws when closed. Abnormal o.; when any of the teeth are not in a position to meet normally. Anatomical o.; contact in which all the teeth are present and meet normally according to the anatomic standard. Balanced o.; the balancing of teeth in eccentric position to harmonize with the condyle and incisal inclinations. Centric o.; contact of the teeth when the jaws are closed in a normal position. The teeth in contact while the mandible is in central relation to the head. Usually defined as that position of the maxillary and mandibular denture

Terminology (Continued)

arches wherein the inclined planes of the teeth are in maximum contact. Defined by the Natural Society of Denture Prosthesis as the st retrusive position of the mandible from which lateral movements can be made at a given degree of jaw separation.

Eccentric o.; contact of the teeth when the lower jaw has moved from the position of rest. The protrusive right and left lateral contacts of the inclined planes of the teeth when the jaw is not moving. Functional o.; such contact of the teeth of both jaws as will provide the highest efficiency during all the excursive movements of the mandible. Lateral o.; contact of the teeth when the lower jaw moves to the right or left of central occlusion. Malocclusion; faulty occlusion; deformed occlusion. Normal o.; meeting of the teeth in normal position and relationship. Posterior o.; occlusion produced when the lower teeth meet the upper teeth back of normal position. Protrusive o.; occlusion of the teeth when the mandible is anterior to central occlusion. Retrusive o.; occlusion of the teeth when the mandible is posterior to central occlusion. Traumatic o.; malocclusion which produces injury to the teeth or to the periodontal tissues.

SRJET; a horizontal overbite of anterior teeth.

PALATE; the roof of the mouth. Cleft p.; a palate with a fissure in the median line of the roof of the mouth present at birth. Hard p.; the anterior part of the roof of the mouth; the bony palate. Soft p.; the posterior part of the palate near the uvula.

PAPILLA; a small nipple shaped elevation. Incisive p.; a rounded projection at the anterior end of the palate. Interdental p.; the triangular pad of gum which fills the space between the necks of the teeth. Lingual p.; any one of the papillae of the tongue.

PERIPHERY; the outward part or the surface or border. A term frequently used to describe the border of a denture or an impression.

PLANE; a flat surface. Axio Buccolingual p.; a plane parallel with bony axis of tooth, passes through buccal and lingual surfaces. Axio Labiolingual p.; a plane parallel with the long s of a tooth, cutting its labial and lingual surfaces. Axio Mediodistal p.; a plane parallel with the long axis of a tooth, cutting its mesial and distal surfaces. Compensating p.; a curved plane which bisects the crest of the upper and

lower ridges. Horizontal p.; a plane passing through the tooth at right angles to its long axis. Occlusal p.; the imaginary line between the upper and lower teeth in normal occlusion.

POSTDAM; a raised ridge 1/8" wide at the posterior border of the denture designed to seal the denture against the palate.

PROCESS; a projecting point. Alveolar p.; the dental ridge projecting from the lower surface of the body of the maxilla containing the alveoli of sockets of the upper teeth; the upper border of the body of the mandible containing the alveoli of the lower teeth. Sometimes termed dental process. Coronoid p.; a conical prominence ascending from the upper anterior part of the ramus of the mandible. Hamular p.; a hook-like process on the lower extremity of the internal pterygoid plate. Maxillary p.; the bony plate which descends from the sieve-like bone which forms a roof for the nasal opening and part of the floor of the front of the skull. Pterygoid p.; a process of the palate bone on its posterior edge articulating with the sphenoid bone.

RAMUS; (Ramus mandibuli), the ramus of the lower jaw, the bone back of the posterior teeth which reaches upward to the head of the condyle.

REBASE; a new base for a denture. Rebasings is frequently necessary after a denture has been in the mouth for a period of time and the underlying tissues have changed.

RELIEF AREAS; These areas are considered in most techniques as requiring a relief of metal over the impression or cast. The relief of metal creates a space between the denture and the tissue.

RESORPTION; the gradual destruction of underlying structure.

RETROMOLAR PAD; behind area of lower molar teeth.

RIDGE; a crest or elevated border. Crest of ridge, the upper edge or summit of a ridge of tissue. The highest point of the ridge. Linguogingival r.; border on lingual surface of anterior teeth near gum. Marginal r.; borders on outer margins of the occlusal surface of posterior teeth. Mylohyoid r.; ridge adjacent to molar teeth and hyoid bone. Oblique r.; the ridge running across the occlusal surface of maxillary molars. Transverse r.; ridge formed on occlusal surface of molars by union of two

Terminology (Continued)

triangular ridges. Triangular r.; a ridge on occlusal surface of molar from point of cusp to center of crown.

SINUS; a recess, cavity, or hollow space.

SLUICE WAYS; the escape ways through which food leaves the occlusal portion of the teeth in the process of chewing.

TISSUE TOLERANCE; the ability of the tissues to tolerate artificial appliances.

TORUS; a bulging projection. Torus palatinus, a bony prominence often found in the center of the palate. Torus mandibularis, a bony prominence found in the region between the first and second bicusps.

TRACING, GOTHIC ARCH; a pin point tracing on soot or carding wax that is shaped by the movements of the mandible - determines centric relation.

TRIAL BASE; baseplate used for arranging the teeth for trial before completion.

TRIAL DENTURE; a denture constructed on a trial base to be fitted in the mouth of the patient before the denture is completed.

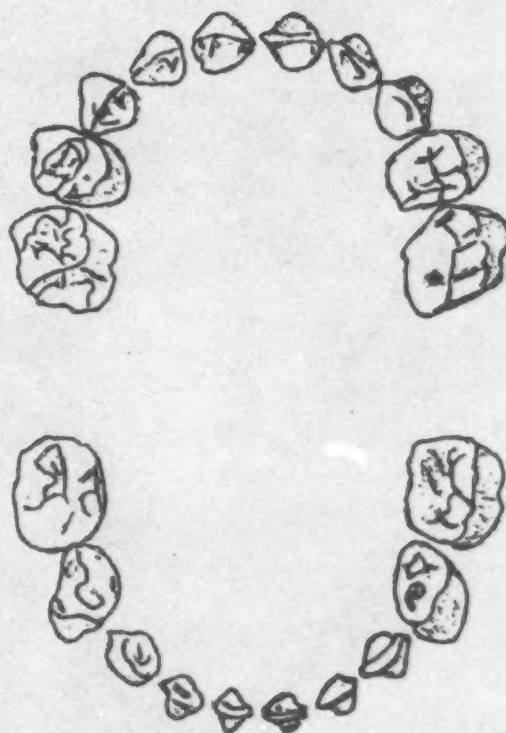
TRIANGLE, BONWILL; a triangle bounded by lines from the center of the alveolar ridge of the lower jaw to the condyles on either side and from one condyle to the other.

TUBEROSITY; a broad, rough platform or eminence on the bone, located at the end of the maxillary ridge. Occasionally the tuberosity will be excessive. When this condition is found it is usually due to the retention of the maxillary posterior teeth after the mandibular molars have been lost. The maxillary teeth in extruding often bring the process down with them.

VERTICAL DIMENSION; space between upper and lower ridges, occupied by either natural teeth or artificial teeth.

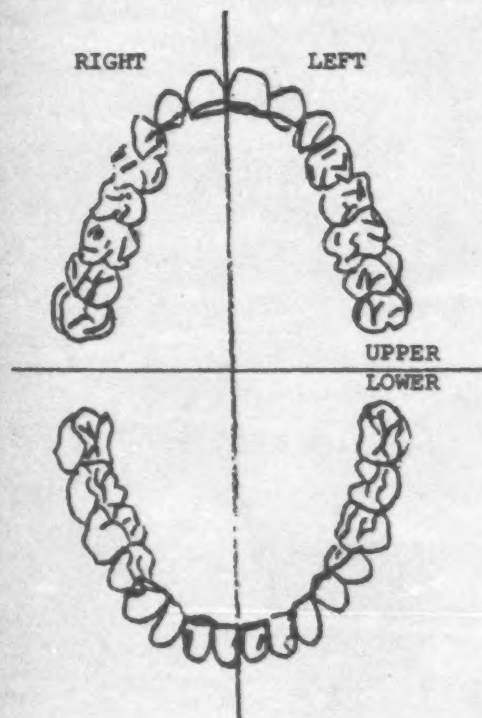
VULCANIZER; a container for the processing of dentures in which steam pressure is employed. Apparatus for the curing of rubber.

WAX BITE; an impression of the upper and lower teeth in wax.



METHODS OF CLASSIFICATIONSPermanent

1. central incisor
2. lateral incisor
3. cuspid
4. first bicuspid (premolar)
5. second bicuspid (premolar)
6. first molar
7. second molar
8. third molar

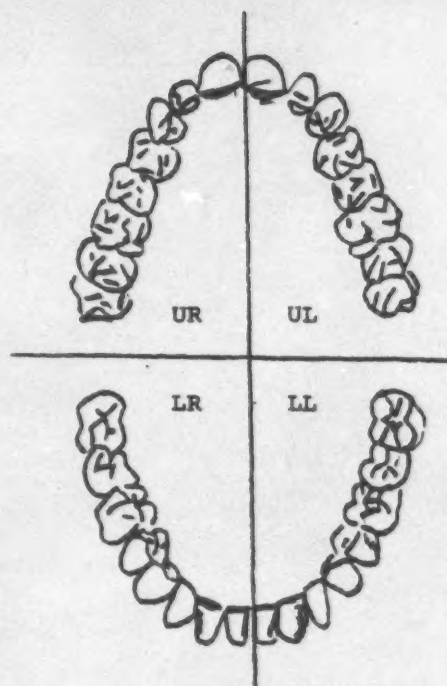


METHOD B

Primary

1. central incisor
2. lateral incisor
3. cuspid
4. first deciduous molar
5. second deciduous molar

- 1 upper left
- 2 upper right
- 3 lower right
- 4 lower left



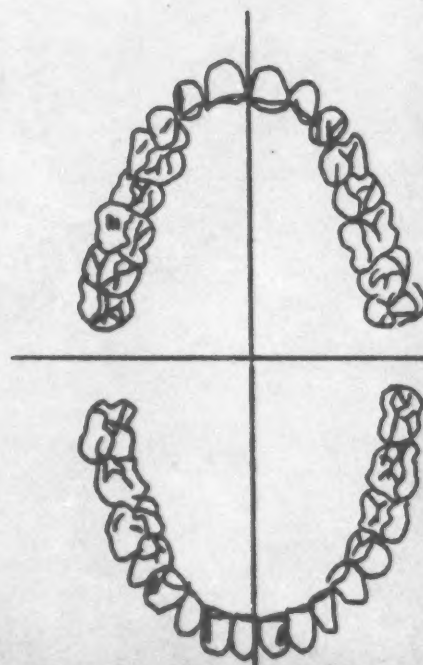
METHOD A

R 14

L 1

R 3

L 11

UPPER
RIGHT
START

The most commonly used method
of classification

Dental Assisting
Assignment Sheet

NAME:

DATE:

A. Name the following teeth using the "Palmer" method.

- | | |
|--------------|--------------|
| 1. <u>5</u> | 12. <u>2</u> |
| 2. <u>6</u> | 13. <u>5</u> |
| 3. <u>8</u> | 14. <u>6</u> |
| 4. <u>3</u> | 15. <u>8</u> |
| 5. <u>D</u> | 16. <u>3</u> |
| 6. <u>A</u> | 17. <u>5</u> |
| 7. <u>C</u> | 18. <u>2</u> |
| 8. <u>B</u> | 19. <u>1</u> |
| 9. <u>7</u> | 20. <u>4</u> |
| 10. <u>I</u> | 21. <u>I</u> |
| 11. <u>4</u> | 22. <u>V</u> |

B. Give the symbol for the following teeth using method "B"

1. UPPER RIGHT LATERAL INCISOR _____
2. UPPER LEFT SECOND MOLAR _____
3. LOWER RIGHT CENTRAL INCISOR _____
4. LOWER LEFT CUSPID _____
5. UPPER RIGHT FIRST MOLAR _____
6. LOWER LEFT FIRST BICUSPID _____
7. LOWER RIGHT THIRD MOLAR _____

B. (cont'd)

8. UPPER LEFT CUSPID _____
9. LOWER RIGHT SECOND MOLAR _____
10. UPPER LEFT SECOND BICUSPID _____

C. Give the symbol for the following teeth using Method "C"

1. UPPER LEFT CENTRAL INCISOR _____
2. LOWER RIGHT LATERAL INCISOR _____
3. UPPER LEFT CUSPID _____
4. LOWER RIGHT FIRST MOLAR _____
5. UPPER RIGHT SECOND MOLAR _____
6. LOWER LEFT FIRST MOLAR _____
7. UPPER RIGHT CUSPID _____
8. LOWER LEFT LATERAL INCISOR _____
9. LOWER RIGHT CENTRAL INCISOR _____
10. UPPER LEFT SECOND BICUSPID _____
11. 6
12. 24
13. 17
14. 2
15. 39
16. 15
17. 20
18. 10
19. 1
20. 16.

Chart the following using method "C" for permanent teeth.

1. LOWER LEFT LATERAL INCISOR _____
2. UPPER RIGHT FIRST MOLAR _____
3. UPPER LEFT SECOND BICUSPID _____
4. LOWER RIGHT CENTRAL INCISOR _____
5. LOWER LEFT CUSPID _____
6. UPPER RIGHT THIRD MOLAR _____
7. UPPER LEFT FIRST BICUSPID _____
9. LOWER RIGHT SECOND BICUSPID _____
9. LOWER LEFT SECOND MOLAR _____
10. UPPER RIGHT CENTRAL INCISOR _____

Chart following using Method "A", deciduous teeth.

1. UPPER LEFT CENTRAL INCISOR _____
2. UPPER RIGHT SECOND MOLAR _____
3. LOWER RIGHT FIRST MOLAR _____
4. LOWER LEFT CUSPID _____
5. A _____
6. C _____
7. E _____
8. B _____
9. D _____
10. B _____

DENTAL ASSISTANT
ASSIGNMENT SHEETNAME:
DATE:

A. GIVE THE MEANING OF THE FOLLOWING SUFFIXES AND PREFIXES:

- | | |
|---------------------|-------------------|
| 1. bi - | 12. end or endo - |
| 2. therm - | 13. hyper - |
| 3. hypo - | 14. inter - |
| 4. pre - | 15. per - |
| 5. denti or dento - | 16. post - |
| 6. odont - | 17. peri - |
| 7. pedo - | 18. trans - |
| 8. -ology - | 19. osis - |
| 9. -itis - | 20. micro - |
| 10. mal - | 21. poly - |
| 11. intra - | 22. pro |

B. NAME THE FOLLOWING TEETH WHICH ARE CHARTED USING METHOD "A".

1. 6
2. I
3. 4
4. 3
5. D
6. A
7. C
8. B
9. 2
10. 7

DENTAL ASSISTANT
ASSIGNMENT SHEET

C. CHART THE FOLLOWING USING METHOD "A" FOR PERMANENT TEETH

1. lower right third molar
2. upper right lateral incisor
3. lower left first bicuspid
4. upper left second bicuspid
5. lower left central incisor

D. CHART THE FOLLOWING USING METHOD "A" FOR PRIMARY TEETH

1. upper right first dec. molar
2. lower left lateral incisor
3. lower right second dec. molar
4. upper left cuspid
5. upper right central incisor

E. CHART THE FOLLOWING USING METHOD "B" FOR PERMANENT TEETH

1. lower right second bicuspid
2. upper left central incisor
3. lower left first molar
4. upper right second molar
5. lower right cuspid

F. CHART THE FOLLOWING USING METHOD "C" FOR PERMANENT TEETH.

1. lower left lateral incisor
2. upper right first molar
3. upper left second bicuspid
4. lower right central incisor
5. lower left cuspid

DENTAL ASSISTANT
ASSIGNMENT SHEET

F. (cont'd)

6. upper right third molar
7. upper left first bicuspid
8. lower right second bicuspid
9. lower left second molar
10. upper right central incisor

G. CHART THE FOLLOWING USING THE METHOD "A", PRIMARY TEETH

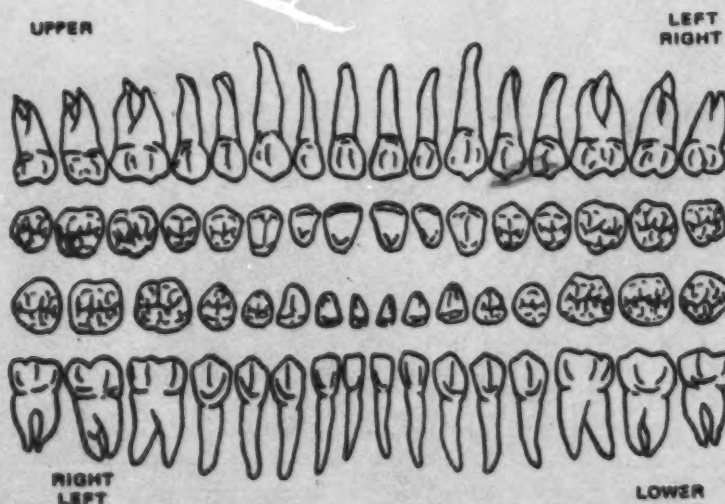
1. upper left central incisor
2. upper right second molar
3. lower right first molar
4. lower left cuspid
5. A
6. C
7. E
8. B
9. D
10. B

PERMANENT TEETH

11. 5
12. 6
13. 8
14. 3
15. 1

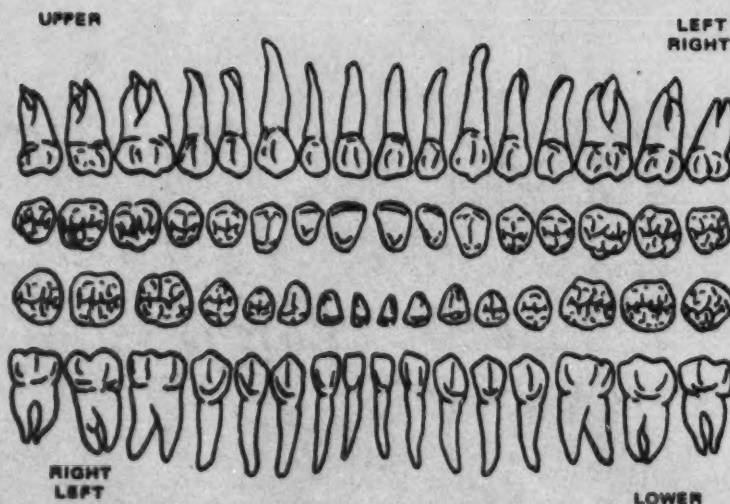
CHARTING EXERCISE

- | | |
|------------------------------|-------------------------------|
| 1. impacted | 17. MOD caries |
| 2. MOD caries | 18. buc. caries, class V |
| 3. occ. amalgam | 19. missing |
| 4. class V, buc. caries | 20. F,M caries |
| 5. M pit amalgam | 21. class I amalgam |
| 6. missing | 22. class III, M,D caries |
| 7. D caries | 23. ok |
| 8. ling., M caries-class IV | 24. class V, adaptic |
| 9. M & D adaptic | 25. M caries |
| 10. F decay and lin. amalgam | 26. class IV, D caries |
| 11. class IV, D caries | 27. missing |
| 12. ok | 28. DO amalgam, drifting |
| 13. occ. caries | 29. occ. amalgam |
| 14. class II, M amalgam | 30. MO caries |
| 15. class V, B caries | 31. MOD amalgam |
| 16. to be extracted | 32. impacted, to be extracted |



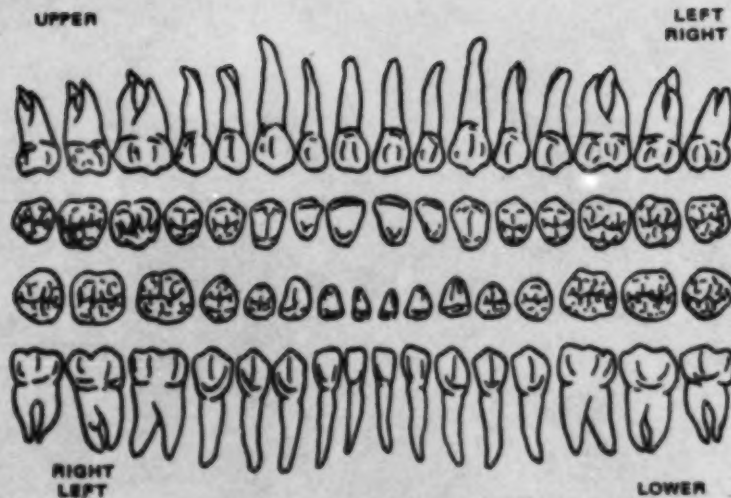
Charting Exercise

- | | |
|-----------------------------|-----------------------------|
| 1. unerupted | 17. impacted |
| 2. DO amalg. R. | 18. missing |
| 3. Buc. pit cavity | 19. occ. decay |
| 4. | 20. |
| 5. M & D pit amalg. R. | 21. fac. C5 tooth color R. |
| 6. | 22. |
| 7. abcess | 23. |
| 8. PJC | 24. ling. amlg. C1 R. |
| 9. | 25. |
| 10. fac. C 5 tooth color R. | 26. M tooth color R. |
| 11. | 27. |
| 12. missing | 28. occ. decay |
| 13. drifting | 29. C 2 D. amalg. R. |
| 14. occ. decay | 30. occ. to ling. amalg. R. |
| 15. | 31. full g. crown |
| 16. to be ext. | 32. impacted |



CHARTING EXERCISE

- | | |
|---------------------------------|-----------------------|
| 1. to be extr. | 17. unerupted |
| 2. MOD g. inlay | 18. C.5 B caries |
| 3. Occ. caries | 19. D, M pit amalg. |
| 4. | 20. } |
| 5. missing | 21. } g.w/proc. fac. |
| 6. CL.5, fac. tooth color rest. | 22. } #21. pontic |
| 7. | 23. abscess |
| 8. PJC. | 24. |
| 9. C.3, M tooth color | 25. C.5 ling. amalg. |
| 10. | 26. C.4 M tooth color |
| 11. | 27. |
| 12. C.1 caries | 28. occ. amalg. |
| 13. M. pit, amal., D decay | 29. |
| 14. DO amalg. | 30. D pit caries |
| 15. | 31. |
| 16. unerupted | 32. unerupted |



CHARTING EXERCISE

UR

8. occ. decay

7. MO amalg., D pit amalg.

6. ling. pit ama., sm. occ. ama.

5. occ. decay

4. missing

3. RCT

2. fac. C.5 adaptic

1. M, adaptic

LL

16. impacted

15. occ. ama., B pit ama.

14. MOD ama.

13. C.5 buc. decay

12. missing

11.

10. C.6 adaptic

9. C.4 M adaptic

UL

1. PJC

2. PJC

3. C.4.D adaptic

4. missing

5. M C,2 decay

6. MODB g. inlay

7. DO ama.

8.

LR

9. C.3 D adaptic

10.

11. fac. adaptic

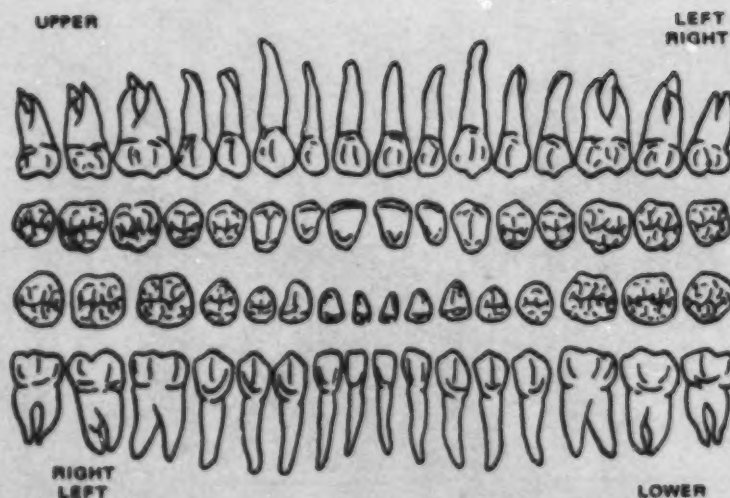
12. missing

13. M pit, D pit ama.

14. occ. decay, buc. pit ama.

15. P. g. cr.

16. impacted



CHARTING EXERCISE

UR

8. unerupt

7. f. g. cr.

6. M. pit and D pit decay

5.

4. fac. C.5 tooth col.

3.

2. RCT, ling, C.1 ama.

1

LL

8. impacted

7.

6. MO and D pit to ling. ama.

5. Occ. decay

4.

3. C.5 ling. tooth color

2.

1. C.4 fracture M

UL

1. M decay

2.

3.

4. M pit and D pit amal.

5. Do amal.

6.

7. Mo-D pit amal. to ling.

8. unerupt

LR

L.

2. M C.3 tooth col. rest.

3.

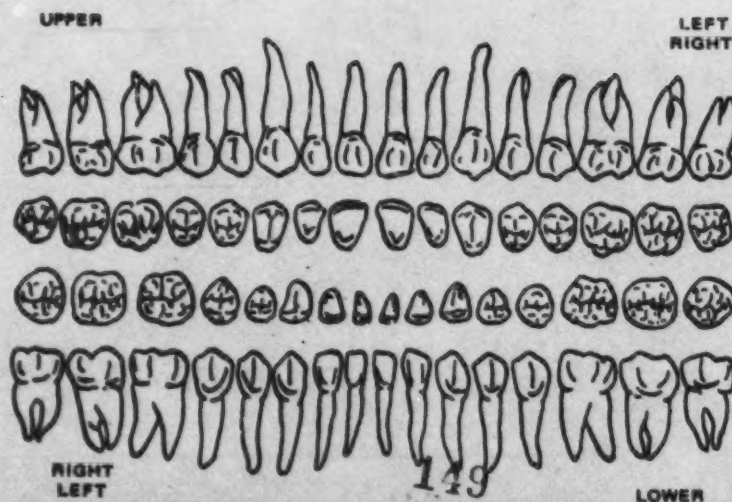
4. occ. tooth color rest.

5. MO amalg.

6. occ. to bucc. amalg.

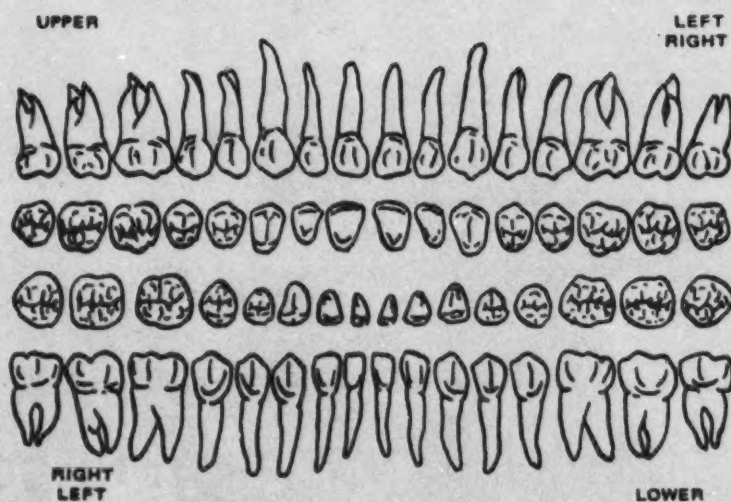
7.

8. impacted



CHARTING EXERCISE

- | | |
|----------------------------|-------------------------------------|
| 1. impacted, to be removed | 17. impacted, to be removed |
| 2. MOD gold inlay | 18. missing |
| 3. DO caries | 19. DO amalgam |
| 4. O amalgam | 20. OK |
| 5. MO amalgam | 21. M pit caries |
| 6. Class III, D caries | 22. Class V, labial adaptic |
| 7. Class III, M adaptic | 23. PJC |
| 8. OK | 24. D adaptic |
| 9. abscess | 25. M adaptic |
| 10. PJC | 26. RCT, abscess |
| 11. OK | 27. ling. caries |
| 12. M,D,B amalgam | 28. MOD amalgam, B caries |
| 13. O caries | 29. Class V amalgam, MOD gold inlay |
| 14. MODB amalgam | 30. MO gold inlay |
| 15. M,O,B caries | 31. MOB amalgam, D pit decay |
| 16. impacted | 32. impacted |



CHARTING EXERCISE

UR

- 8 to be removed
- 7 DO g. inlay
- 6 NO caries
- 5 MOD amalgam
- 4 class II, caries D
- 3 class III, M adaptic
- 2 M,F adaptic
- 1 D caries

LL

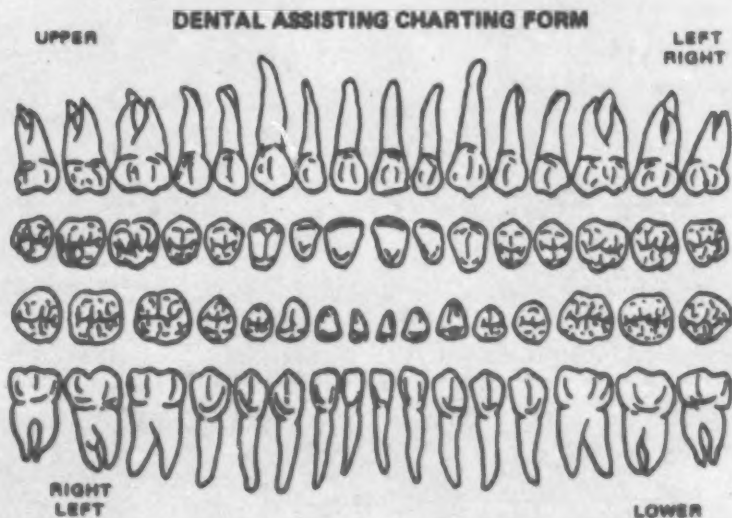
- 8 full g. cr.
- 7 DO caries, class II
- 6 abut. f. g. cr.
- 5 abut. porc. fac.
- 4 pontic- porc. fac.
- 3 pontic- porc. fac.
- 2 pontic- porc. fac.
- 1 abut. porc. fac.

UL

- 1 abscess
- 2 PJC
- 3 class V, lin. amalgam
- 4 DO amalgam
- 5 MOD caries
- 6 occ. amalgam, RCT
- 7 missing
- 8 D pit caries, drifting

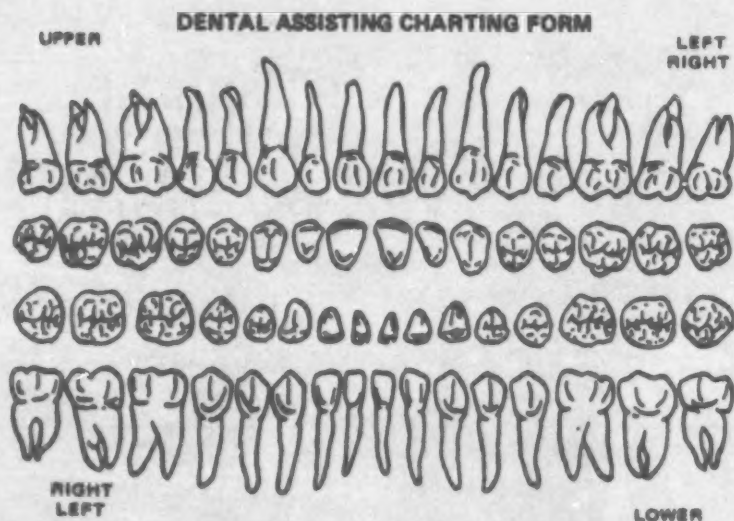
LR

- 1 li. caries, abscess
- 2 RCT - PJC
- 3 D caries, class IV
- 4 MO caries
- 5 class I, caries
- 6 MOD g. inlay
- 7 full g. cr.
- 8 been removed



CHARTING EXERCISE

- | | |
|-----------------------|----------------------------|
| 1 to be removed | 17 been extracted |
| 2 DO g. inlay | 18 occ. inlay |
| 3 MO caries | 19 class V, buc. caries |
| 4 MOD amalgam | 20 class II, MO amalgam |
| 5 class II, D caries | 21 DO g. inlay |
| 6 class V, adaptic | 22 g. cr., porc. fac. |
| 7 M.F adaptic | 23 D adaptic |
| 8 OK | 24 M adaptic |
| 9 abscess | 25 OK |
| 10 PJC | 26 class IV, M caries |
| 11 abut. porc. fac. | 27 M,D, caries |
| 12 pontic- porc. fac. | 28 occ. caries |
| 13 pontic- porc. fac. | 29 DO amalgam |
| 14 abut.- porc. fac. | 30 missing |
| 15 MO caries | 31 MO inlay drifting |
| 16 impacted | 32 impacted, to be removed |



CHARTING EXERCISE

UL

8 full g. cr.

7 MOD,B,L amalgam

6 MO caries

5 abut. porc. fac. }

4 pontic

3 abut. porc. fac. }

2 M,D caries

1 OK

UR

1 class IV, M adaptic

2 class I, L amalgam

3 class III, D caries

4 MOD g. inlay

5 DO amalgam

6 RCT - class I, occ. amalgam

7 D pit caries

8 impacted, to be removed

LR

8 DO amalgam

7 class V, B caries

6 g. cr., porc. fac.

5 M & F adaptic

4 class II, D caries

3 PJC w/ RCT

2 abscess, ling. caries

1 class III, M caries

LL

1 class IV, M adaptic

2 lab. caries

3 g. cr., porc. fac.

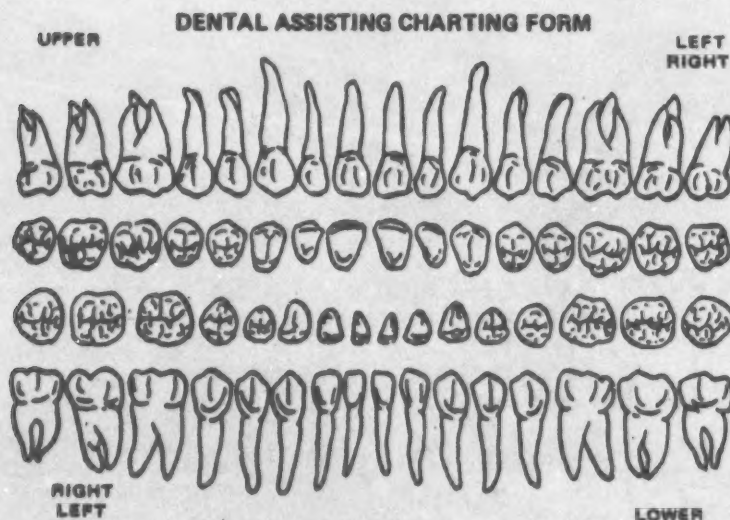
4 MOD caries

5 occ. amalgam

6 abut- g. cr., porc. fac. }

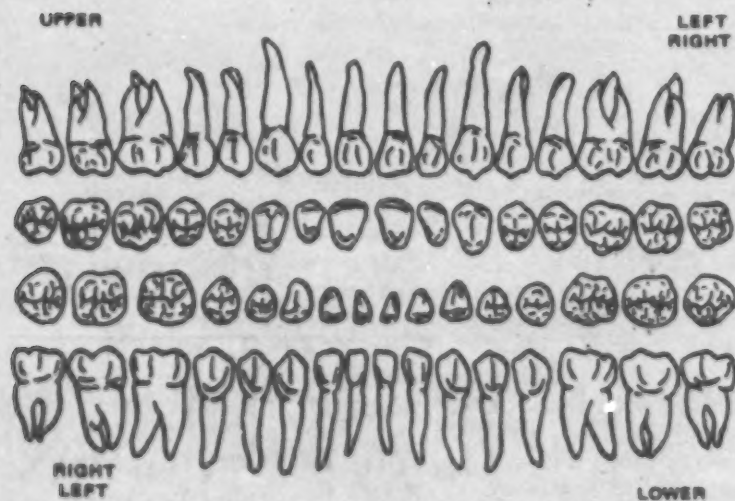
7 pontic

8 abut- full g. cr. }



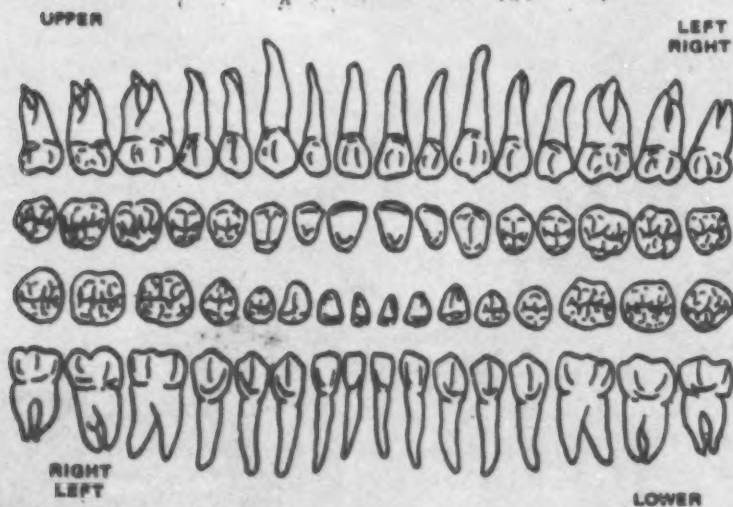
CHARTING EXERCISE

- | | |
|--------------------------|--------------------------------------|
| 1 impacted | 17 abscessed, to be removed |
| 2 full g. cr. | 18 MOD, B, amal |
| 3 M,D pit cares | 19 Class I occ. caries |
| 4 Class II,D caries | 20 g. cr. porc. fac. } |
| 5 MOD g. inlay | 21 g. cr. porc. fac. } |
| 6 PJC | 22 Class III M, adaptic |
| 7 II. amal. | 23 Class III Distal caries |
| 8 abut. - all porc. } | 24 M & D adaptic |
| 9 pontic - all porc. } | 25 II. caries, Class V - lab. caries |
| 10 pontic - all porc. } | 26 Class V fac. adaptic |
| 11 abut. all porc. } | 27 g. cr. porc fac. |
| 12 Class V, B, caries | 28 DO, caries - Class II |
| 13 fac. adaptic | 29 abut - g. cr. - porc. fac. } |
| 14 missing | 30 pontic - g. cr. - porc fac. } |
| 15 drifting, MOD g.inlay | 31 pontic - full g. cr. |
| 16 full g. cr. | 32 abut full g. cr. |



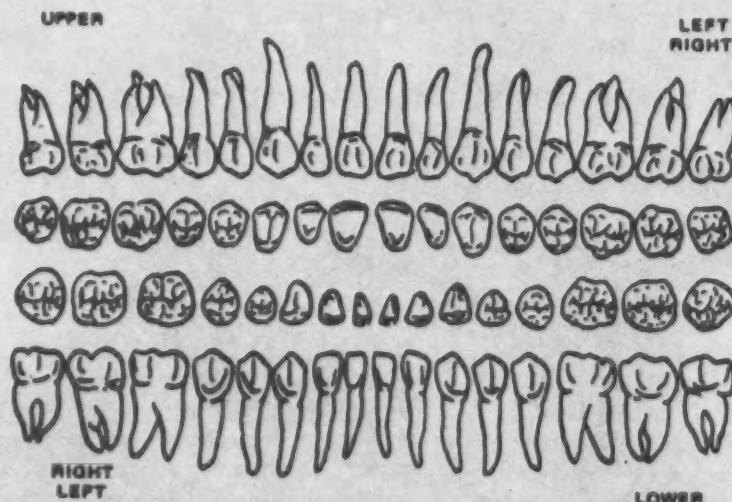
CHARTING EXERCISE

UR 8 to be removed - drifting	LL 8 impacted - to be removed
7 missing	7 DO caries
6 DO caries, class II	6 full g. cr.
5 F adaptic - class V & occ - amal.	5 abut - por. fac. }
4 M caries - class II	4 pontic - por. fac. }
3 PJC	3 abut - por. fac. }
2 abscess - II. class V amal. -	2 class III M caries
1 M adaptic - class I/II	1 PJC - RCT
UL 1 gold cr w/porc. fac.	LR 1 II. cares - abscess
2 D adaptic - class IV	2 M,F adaptic
3 class V II. caries	3 D caries
4 MO amal.	4 abut g. cr. porc. fac. }
5 class II, D caries	5 pontic g. cr. porc. fac. }
6 class I adaptic	6 pontic g. cr. porc. fac. }
7 missing	7 pontic - full g. cr.
8 drifting - occ. caries	8 abut - full g. cr.



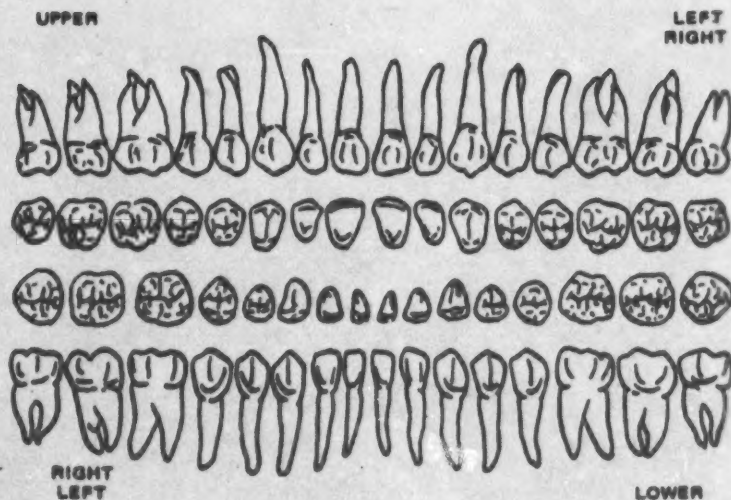
CHARTING EXERCISE

- | | |
|-------------------------------|---|
| 1 unerrupted | 17 full g. crown |
| 2 occ. & cl.V amalg. on bucc. | 18 occ. amalg. continue down over DL cusp |
| 3 drifting | 19 Buc. pit amalg. |
| 4 missing | 20 MOD g. inlay |
| 5 DO amalg. | 21 D caries |
| 6 D adaptic | 22 M adaptic |
| 7 M & D adaptic | 23 RCT |
| 8 fracture on D | 24 M & D adaptic |
| 9 ling. caries | 25 abut.- |
| 10 abscess | 26 pontic- |
| 11 D caries, cl. IV | 27 abut.- |
| 12 ok | 28 ok |
| 13 M pit caries | 29 abut.- |
| 14 occ. caries | 30 pontic- |
| 15 ok | 31 abut.- |
| 16 MO caries, D pit amalg. | 32 impacted |
- } all porcel.
 } bridge
 } a g. bridge w/ porc.
 } facing on #29 & #30



CHARTING EXERCISE

- | | |
|----------------------------------|---------------------------|
| 1. impacted, to be extracted | 17 missing |
| 2 full g. cr. | 18 MOD amalgam |
| 3 MO amalgam, drifting | 19 MOD g. inlay |
| 4 missing | 20 full gold crown |
| 5 class I, 0 caries | 21 Occ. caries |
| 6 PJC | 22 Class IV, D caries |
| 7 abscess-lingual class I caries | 23 Class III, M adaptic |
| 8 RCT | 24 OK |
| 9 abutment | 25 RCT |
| 10 pontic } all porcelain | 26 D,M caries-class III |
| 11 abutment } | 27 Class V, Ling. amalgam |
| 12 M pit amalgam | 28 DO amalgam |
| 13 D amalgam, class II | 29 OK |
| 14 OK | 30 DO gold inlay |
| 15 OK | 31 missing |
| 16 to be extracted | 32 impacted |



CHARTING EXERCISE

UL

- 8 to be extracted
- 7 MOD Gold inlay
- 6 Occ. caries
- 5 missing
- 4 gold crown w/ porc. fac.
- 3 class V, Lab. adaptic
- 2 PJC
- 1 recession-cervical 1/3

LR

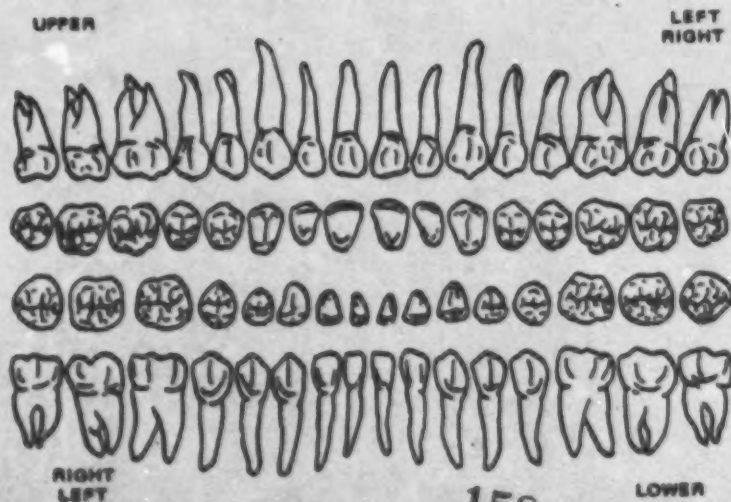
- 8 unerupted
- 7 class V, B caries
- 6 D, M pit amalgam
- 5 abutment - full g. cr.
- 4 pontic - g. cr. w/ porc. fac.
- 3 abutment-g. cr. w/ porc. fac.
- 2 abscessed
- 1 RCT

UR

- 1 class III, M adaptic
- 2 RCT
- 3 OK
- 4 class I, caries
- 5 M, D caries
- 6 DO amalgam
- 7 M pit caries
- 8 impacted

LL

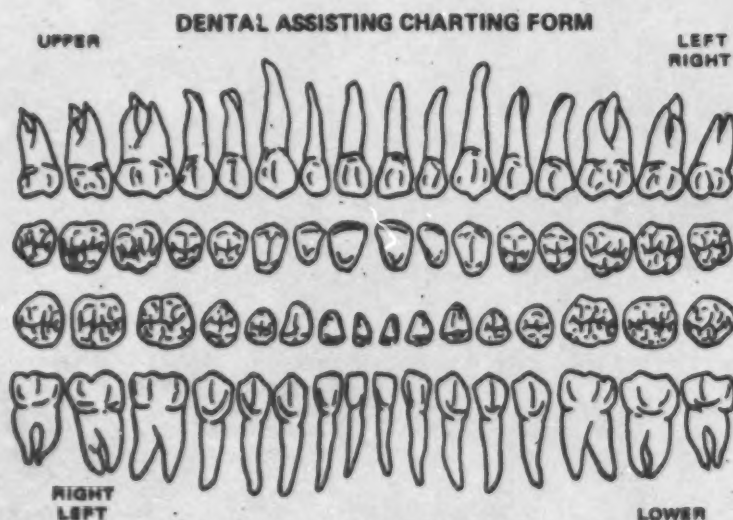
- 1 class V, Ling. amalgam
- 2 Class IV, M adaptic
- 3 OK
- 4 Occ. amalgam
- 5 MOD amalgam
- 6 D pit caries
- 7 central pit amalgam
- 8 impacted, to be extracted



CHARTING EXERCISE

- | | |
|-----------------------------------|---|
| 1 | 17 impacted |
| 2 MOD to ling. amal.
drifting | 18 MOD amal. |
| 3 Missing | 19 Missing |
| 4 | 20 Missing |
| 5 S.S. crown | 21 M and D pit decay |
| 6 | 22 |
| 7 | 23 |
| 8 M- (tooth color rest.) | 24 Missing |
| 9 Ling. Cl 1 amal. | 25 |
| 10 | 26 Missing |
| 11 Cl. 5, fac. (tooth color rest) | 27 Missing |
| 12 | 28 |
| 13 M and D pit amal. | 29 MO amal. |
| 14 M pit decay; D amal. | 30 Occ decay |
| 15 F. gold crown | 31 MO to Buc. and D pit to ling., amal. |
| 16 | 32 impacted |

NOTE: #19-20-24-26-27 replace by lower clasp partial. Clasps on M#18, D#21, M#28.



Charting Exercise

UR 8

7 MOD amal. decay around mar.

6

5 occ. temp. ZOE

4

3

2

1 M tooth color rest.

LL 8 impacted

7 MO amal, DO amal

6

5 Occ decay

4

3

2 Cl. 5 ling. decay

1 Cl. 5 facial decay

UL 1 Cl 3, M. tooth color rest

2

3

4 M and D pit amal

5

6 Full gold crown

7 MODBL amal

8 been extracted

LR 1

2 D. Cl. 3 tooth color rest

3

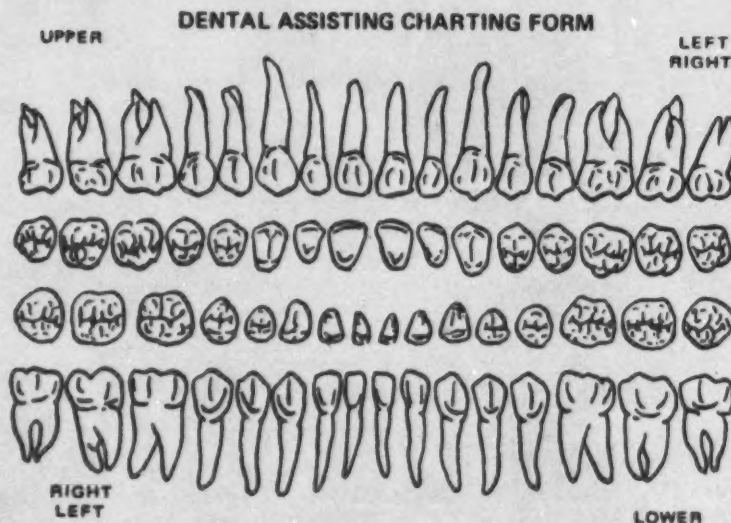
4 MO amal

5

6 MOD amal

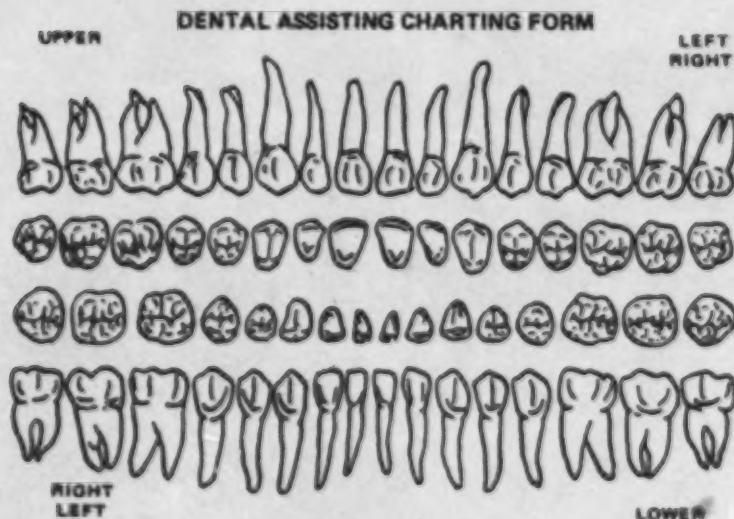
7 S.S. crown

8 Unerrupted



CHARTING EXERCISE

- | | |
|---|----------------------------|
| 1 unerrupted | 17 impacted |
| 2 D pit amalgam, MO | 18 OL amalgam |
| 3 DO to lingual amalgam | 19 MOD amalgam |
| 4 occ. & C.5 facial amalgam | 20 |
| 5 | 21 D pit amalgam |
| 6 DL amalgam & Cl. 5 tooth colored facial | 22 |
| 7 ling. pit amalgam | 23 RCT. |
| 8 D C. 3 tooth color | 24 CL. 4 on M, tooth color |
| 9 3 unit porcel bridge | 25 |
| 10 3 unit porcel bridge, Pontic | 26 all porcel jacket |
| 11 3 unit porcel bridge | 27 |
| 12 | 28 |
| 13 M & D pit amalgam | 29 DO gold inlay |
| 14 MO caries & D pit amalgam | 30 Bucc. Cl. 1-amalgam |
| 15 full gold crown | 31 full gold crown |
| 16 has been extracted | 32 |

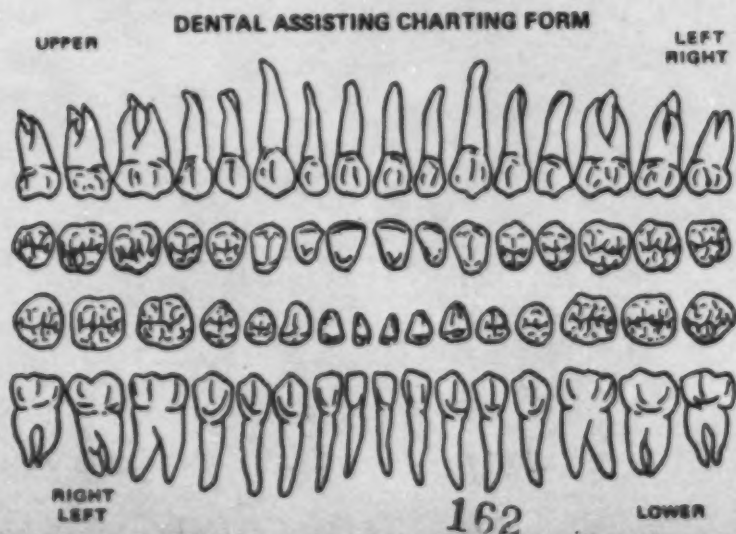


146
CHARTING EXERCISE

- | | |
|--|---|
| <p>1</p> <p>2 D pit to ling amal-M pit & B pit amal.</p> <p>3 D pit amalg.-M pit decay</p> <p>4 MO amalgam</p> <p>5 missing</p> <p>6 PJC</p> <p>7</p> <p>8 M- C1. 3 (tooth color rest)</p>
<p>9</p> <p>10 C1. 5 facial(tooth color rest)</p> <p>11</p> <p>12 missing</p> <p>13 ZOE- occlusal</p> <p>14 M pit decay</p> <p>15 MO amalgam, DO to ling. amalg.</p> <p>16</p> | <p>17 unerupted</p> <p>18. occ, amalg, & bucc. pit amalg.</p> <p>19</p> <p>20 M& D pit decay</p> <p>21 missing</p> <p>22</p> <p>23</p> <p>24 D-(tooth color rest)</p>
<p>25 abutement</p> <p>26 pontic</p> <p>27 abutement</p> <p>28 missing</p> <p>29</p> <p>30 MOD amalgam</p> <p>31 Full Gold Crown</p> <p>32 unerupted</p> |
|--|---|
- 3-Unit Bridge

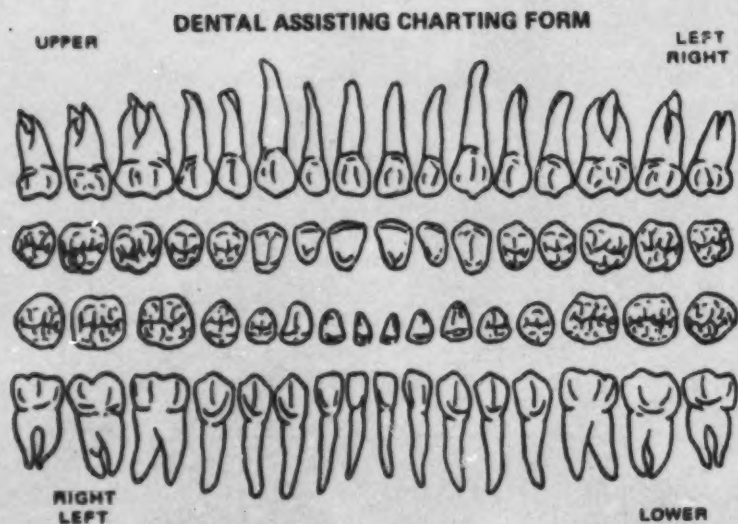
all porcelain

REMARKS: Max. third molars partially erupted- needs plaque control- heavy accum. on ling. of mand. inc.-gingiva puffy this area.



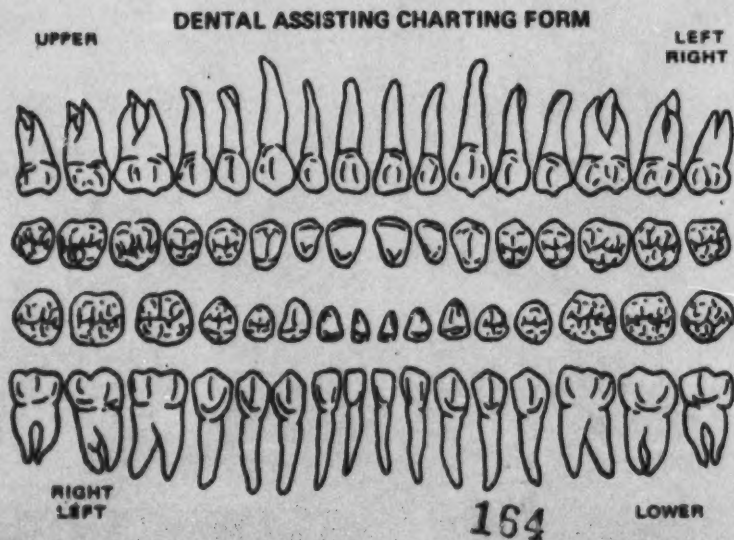
CHARTING EXERCISE

- | | |
|--------------------------------------|-------------------|
| 1 | 17 impacted |
| 2 MO amal, D pit decay | 18 Occ amal. |
| 3 occ amal. | 19 MOD gold inlay |
| 4 | 20 clasp |
| 5 fac. Cl. 5 tooth color rest. | 21 missing |
| 6 | 22 missing |
| 7 ling. pit amal. | 23 missing |
| 8 M Cl. 3 tooth color rest | 24 clasp |
| 9 | 25 missing |
| 10 ling. pit amal. | 26 missing |
| 11 Cl.4, M. fracture | 27 clasp |
| 12 | 28 missing |
| 13 MOD amal | 29 clasp |
| 14 Buc. pit and amal. and occ. decay | 30 MO amal |
| 15 M and central pit decay | 31 DOL amal |
| 16 | 32 |



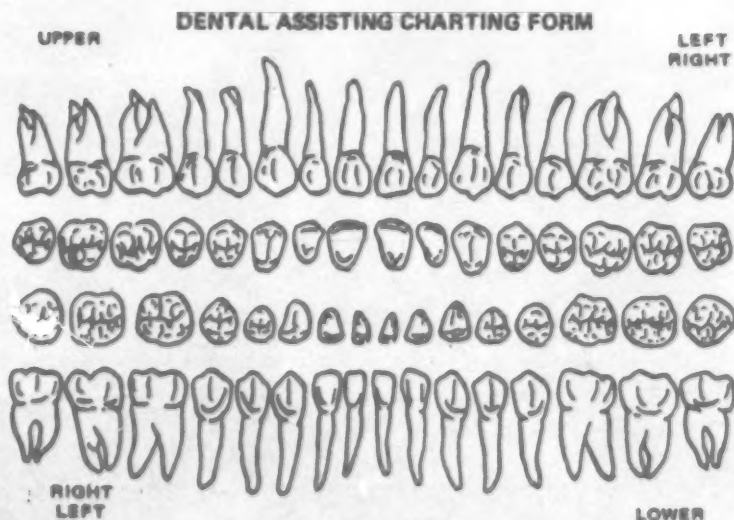
CHARTING EXERCISE

- | | |
|-------------------------------|-----------------------------|
| 1 | 17 impacted |
| 2 MC pit amalgam, D pit decay | 18 occ amalgam |
| 3 MOL amalgam | 19 MODgL amalgam |
| 4 C. 2, D amalgam | 20 DO amalgam |
| 5 occ. decay | 21 |
| 6 | 22 C. 5 tooth color, facial |
| 7 ling. pit amalgam | 23 |
| 8 M, tooth color rest. | 24 ging. rec-cer 1/3 root |
| 9 4 unit, porcel. bridge | 25 RCT |
| 10 4 unit, porcel, bridge | 26 |
| 11 4 unit, bridge (pontic) | 27 |
| 12 4 unit porcel, bridge | 28 M & D pit amalgam |
| 13 | 29 missing |
| 14 | 30 drifting (mesial) |
| 15 D pit decay, B pit amal | 31 full gold crown |
| 16 | 32 impacted |



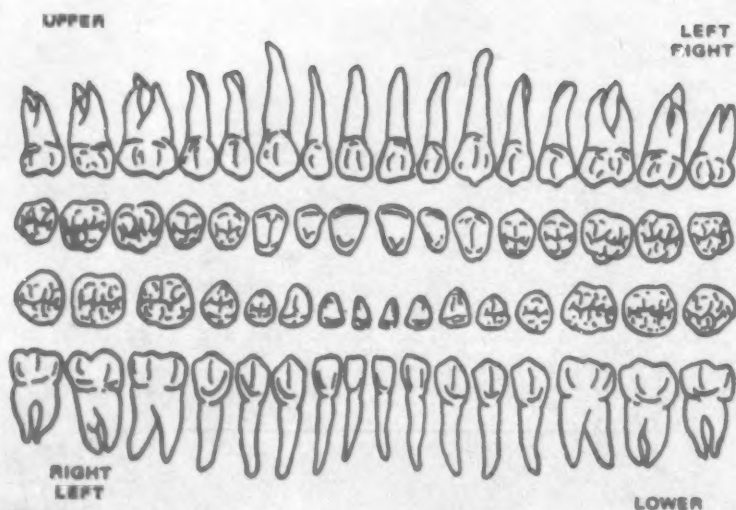
CHARTING EXERCISE

- | | |
|--|--|
| 1. Mesial pit decay | 17 has been extracted |
| 2 M pit to lingual amalg. & D pit amalg. | 18. missing |
| 3 Occlusal amalg.-drifting | 19. D pit to ling. amalg. & cl. 5 ling. amalg.
class 1 buccal pit decay |
| 4. missing | 20 |
| 5 | 21 occ. decay |
| 6 Cl. 5 fac. (tooth c. rest) | 22 |
| 7 Cl. 3, M decay | 23 |
| 8 | 24 Cl. 3, D caries |
| 9 PJC | 25 |
| 10 Cl. 1, ling. amalg. | 26 Cl. 3, M Tooth color rest. |
| 11 | 27 |
| 12 M pit, D pit amalg. | 28 missing |
| 13 abut. | 29 drifting, occ. amalg. |
| 14 pontic 3 unit gold bridge | 30 M pit to bucc. amalg. |
| 15 abut. | 31 bucc pit decay |
| 16 unerrupted | 32 |



Charting Exercise

- | | |
|-----------------------------|------------------------------|
| 1. to be extr. | 17. unerupted |
| 2. MOD g. inlay | 18. C5 B caries |
| 3. occ. caries | 19. D,M pit amalg. |
| 4. | 20. } |
| 5. missing | 21. } g w/ porc. fac. pontic |
| 6. C1.5 fac. tooth color R. | 22. } |
| 7. | 23. abcess |
| 8. PJC | 24. |
| 9. C3 M tooth color | 25. C5 ling. amalg. |
| 10. | 26. C4 M tooth color |
| 11. | 27. |
| 12. C1 caries | 28. occ. amalg. |
| 13. M pit D amalg. decay | 29. |
| 14. DO amalg. | 30. D pit caries |
| 15. | 31. |
| 16. unerupted | 32. unerupted |



CHARTING EXERCISE

UR

8 occ. decay, & buc. pit decay

7 M pit & D pit to ling. amal

6 M pit amal & buc pit amal

5

4 M pit decay

3

2

1 ging receded to middle 3rd rt

LL

8 unerrupted

7

6 occ. temp. restoration (ZOE)

5 D pit amalgam

4

3

2 M, Cl. 4 fracture

1

UL

1

2 Cl 5 ling. amalgam

3 Cl 5 fac decay

4

5 D pit decay

6 Cl 5 ling. decay

7 M pit amalgam, D pit decay

8 been extracted

LR

1

2

3 missing

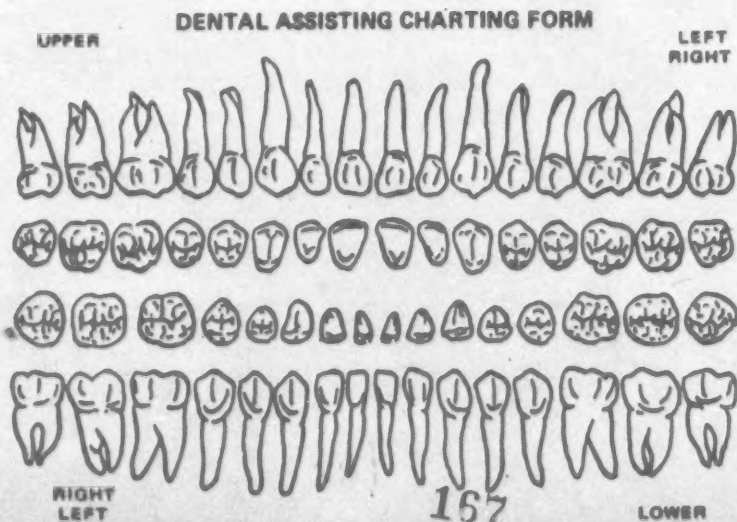
4 drifting, DO amalgam

5 M caries

6 M pit to ling. amalgam

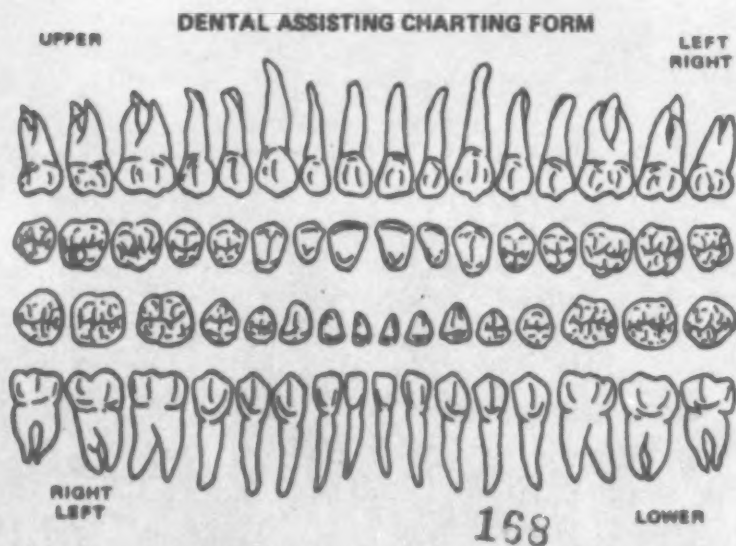
7

8 unerrupted



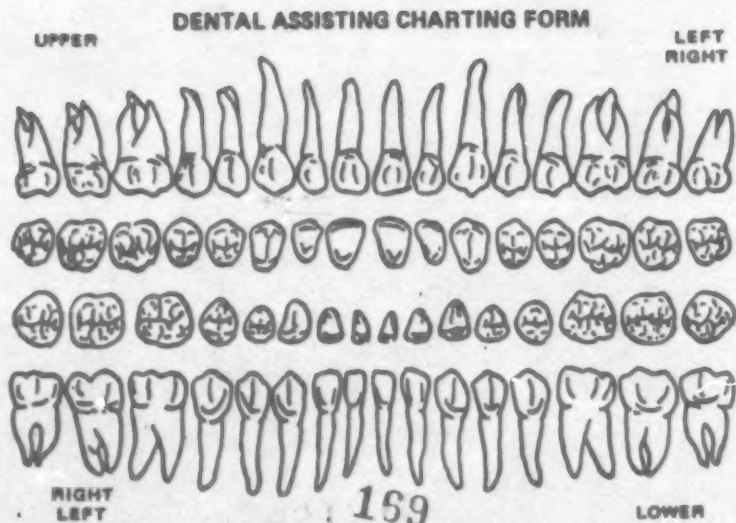
CHARTING EXERCISE

- | | |
|--|--------------------------------|
| 1 unerrupted | 17 impacted |
| 2 occ. amalgam & buc. pit | 18 MOD amalgam |
| 3 M, Cent. pit, and D pit amal | 19 MODLB amalgam |
| 4 | 20 occ. decay |
| 5 occ. amalgam | 21 |
| 6 | 22 |
| 7 ling. pit decay & M rest | 23 |
| 8 D rest. & inc. edge CL. 4 | 24 |
| 9 inc. edge rest, M&D rest. | 25 |
| 10 M & D rest, ling. pit amal | 26 |
| 11 Cl. 4 M rest. | 27 |
| 12 | 28 Cl. 2 mes. amalgam |
| 13 | 29 DO amalgam |
| 14 M.C. pit amal D pit amal,
B. pit amal. | 30 MO amalgam & buc. pit decay |
| 15 MO amalgam | 31 occ. amalgam |
| 16 | 32 unerrupted |



CHARTING EXERCISE

- | | |
|------------------------------------|----------------------------------|
| 1 | 17 impacted |
| 2 D pit amal., M pit to buc. amal. | 18. occ. amal. & buc. pit amalg. |
| 3 MO amalgam | 19 |
| 4 D pit decay | 20 Mesial pit decay |
| 5 | 21 |
| 6 C1 5 fac (tooth-color rest) | 22 |
| 7 | 23 Class 5 facial decay |
| 8 | 24 |
| 9 C1 1 lingual amalgam | 25 |
| 10 | 26 |
| 11 | 27 Class 5 facial decay |
| 12 missing | 28 |
| 13 drifting-MO amalgam | 29 MO amalgam |
| 14 | 30 |
| 15 | 31 MOD gold inlay |
| 16 | 32 impacted |



CHARTING EXERCISE

UL

- 8 impacted
- 7 MO caries
- 6 D amalgam
- 5 MO g. inlay
- 4 M,F caries
- 3 D adaptic, class IV
- 2 class V, la. adaptic
- 1 PJC

LR

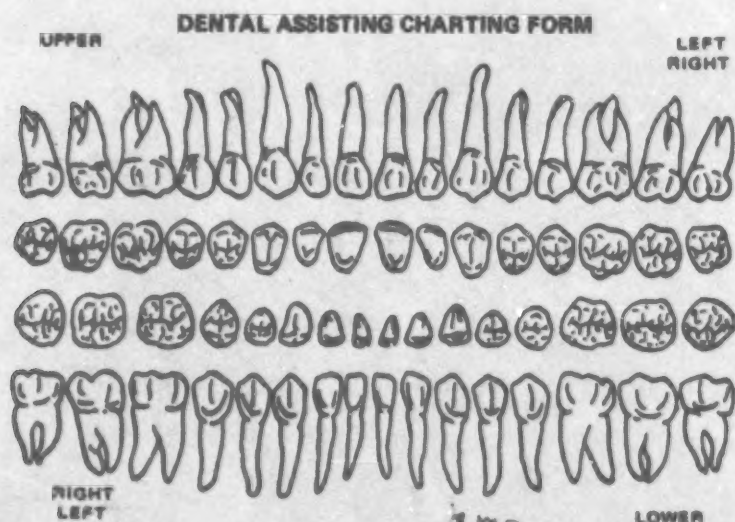
- 8 impacted
- 7 full g. cr.
- 6 MO caries
- 5 class V, B caries
- 4 missing
- 3 PJC
- 2 M adaptic, caries on margins
- 1 D,F caries

UR

- 1 RCT, abscess
- 2 D caries
- 3 class IV, M adaptic
- 4 DO caries
- 5 MOD amalgam
- 6 class V, B adaptic
- 7 occ. caries
- 8 to be removed

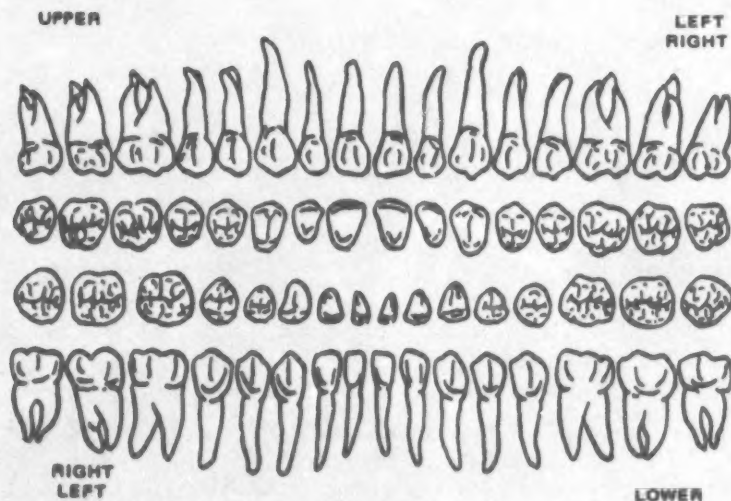
LL

- 1 D adaptic, class III
- 2 class V, ling. amalgam
- 3 class V, F caries
- 4 MO amalgam
- 5 D pit, and class V, buc. caries
- 6 class II, M caries
- 7 MO g. inlay
- 8 impacted



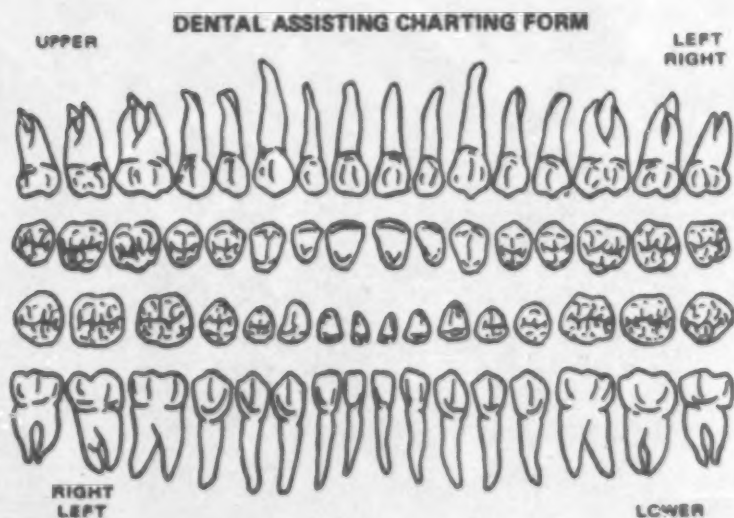
CHARTING EXERCISE

- | | |
|------------------------|-------------------------------------|
| 1 MO amalgam | 17 impacted |
| 2 D pit amalgam | 18 class I, occ. caries |
| 3 MOD amalgam | 19 MOD gold inlay |
| 4 Class V, Buc. caries | 20 class II, DO caries |
| 5 occ. caries | 21 to be extracted |
| 6 M class III adaptic | 22 class I, lin. caries |
| 7 D class IV, caries | 23 PJC |
| 8 PJC | 24 M, class III, adaptic |
| 9 RCT | 25 M, class III, caries |
| 10 missing | 26 class I, lin. amalgam |
| 11 M, class IV, caries | 27 class V, lab. caries |
| 12 DOB amalgam | 28 MO amalgam, decay around margins |
| 13 Class V, Buc. decay | 29 class I, M pit, and D pit caries |
| 14 missing | 30 missing |
| 15 class I, decay | 31 class II, DO caries, drifting |
| 16 impacted | 32 impacted, to be removed |



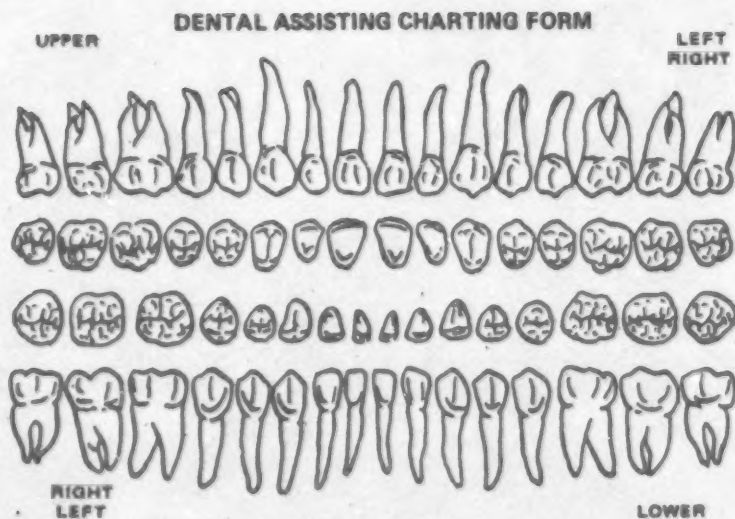
CHARTING EXERCISE

- | | |
|-----------------------------|------------------------------|
| 1 impacted | 17 MOD caries |
| 2 MOD caries | 18 buc. caries, class V |
| 3 occ. amalgam | 19 missing |
| 4 class V, buc. caries | 20 F, M caries |
| 5 M pit amalgam | 21 class I amalgam |
| 6 missing | 22 class III, M, D caries |
| 7 D caries | 23 ok |
| 8 ling., M caries- class IV | 24 class V, adaptic |
| 9 M & D adaptic | 25 M caries |
| 10 F decay and lin. amalgam | 26 class IV,D caries |
| 11 class IV, D caries | 27 missing |
| 12 ok | 28 DO amalgam, drifting |
| 13 occ. caries | 29 occ. amalgam |
| 14 class II, M amalgam | 30 NO caries |
| 15 class V, B caries | 31 MOD amalgam |
| 16 to be extracted | 32 impacted, to be extracted |



CHARTING EXERCISE

- | | |
|------------------------------------|----------------------------------|
| 1 | 17 impacted |
| 2 D pit amal., M pit to buc. amal. | 18. occ. amal. & buc. pit amalg. |
| 3 MO amalgam | 19 |
| 4 D pit decay | 20 Mesial pit decay |
| 5 | 21 |
| 6 C1 5 fac (tooth-color rest) | 22 |
| 7 | 23 Class 5 facial decay |
| 8 | 24 |
| 9 C1 1 lingual amalgam | 25 |
| 10 | 26 |
| 11 | 27 Class 5 facial decay |
| 12 missing | 28 |
| 13 drifting-MO amalgam | 29 MO amalgam |
| 14 | 30 |
| 15 | 31 MOD gold inlay |
| 16 | 32 impacted |



METHOD "A" IDENTIFICATION

First write the number of the tooth you wish to indicate, for example a first molar: 6. Then if the 6 is an upper first molar, let the number be placed above a short line, thus: 6. If it is an upper right first molar, add a vertical line to the right side of the number, thus: 6|. If the 6 is lower first molar, let the number be placed below a short line, thus: 6. If it is a lower left first molar, add a vertical line to the left side of the number, thus: |6. An upper left first molar would be |6. and a lower right first molar would be 6|.

METHOD "B" IDENTIFICATION

The teeth on the maxillary arch are numbered 1-8 in each quadrant, starting with central incisors. The teeth on the mandibular arch are numbered 9-16 in each quadrant starting with central incisors. Thus: the maxillary teeth are numbers 1-8, the mandibular teeth are 9-16. Determine the tooth's number; the number tells you if it is an upper or lower tooth. Then add and R for the right side or an L for left.

METHOD "C" IDENTIFICATION

Begin with the upper right third molar, numbering it #1 and progressing around the upper arch to #16. After numbering the upper left third molar as #16, the charting then drops to the lower left third molar as #17 and progresses to the lower right third molar, which is #32.

Dental Assistant

Name:

Assignment Sheet

Date:

Name the following teeth, written in the 3 different methods.

- | | |
|--------------|--------------|
| 1. 18 | 20. R10 |
| 2. R14 | 21. <u>7</u> |
| 3. <u>1</u> | 22. 28 |
| 4. 8 | 23. L5 |
| 5. L1 | 24. <u>4</u> |
| 6. <u>8</u> | 25. 20 |
| 7. 10 | 26. R16 |
| 8. R7 | 27. <u>A</u> |
| 9. <u>3</u> | 28. 1 |
| 10. 25 | 29. L3 |
| 11. L13 | 30. <u>E</u> |
| 12. <u>6</u> | 31. 32 |
| 13. 31 | 32. R6 |
| 14. R11 | 33. <u>C</u> |
| 15. <u>5</u> | 34. 14 |
| 16. 3 | 35. <u>B</u> |
| 17. L8 | 36. 6 |
| 18. <u>2</u> | 37. <u>D</u> |
| 19. 12 | 38. 23 |

Define the following cavity classifications.

CLASS I

CLASS 2-

CLASS 3-

CLASS 4

CLASS 5

CLASS 6-

REFERRING DENTIST _____

A-EXCELLENT C-FAIR F-POOR

[illegible]

NAME _____

REFERRING DENTIST _____

A-EXCELLENT C-FAIR F-POOR

[illegible]

The diagram illustrates a dental arch with 32 numbered positions for teeth, arranged in two rows: UPPER and LOWER. The arch is divided into RIGHT and LEFT sides by a central vertical dashed line.

UPPER ARCH:

- RIGHT SIDE (1-8):** Positions 1 through 8 are shown in a single row.
- LEFT SIDE (9-16):** Positions 9 through 16 are shown in a single row.

LOWER ARCH:

- RIGHT SIDE (28-32):** Positions 28 through 32 are shown in a single row.
- LEFT SIDE (17-27):** Positions 17 through 27 are shown in a single row.

The numbering is as follows:

- UPPER RIGHT:** 1, 2, 3, 4, 5, 6, 7, 8
- UPPER LEFT:** 9, 10, 11, 12, 13, 14, 15, 16
- LOWER RIGHT:** 32, 31, 30, 29, 28
- LOWER LEFT:** 17, 18, 19, 20, 21, 22, 23, 24

REMARKS

[illegible]

"DYNAMICS OF DENTAL CARIES"

Knowledge about dental caries has progressed in great steps during recent years. This has been due to a considerable increase in the amount of basic dental research being done in this country and abroad as well as improved research tools, such as the electron microscope.

Dental caries is generally believed to be caused primarily by acid decalcification of the mineral structure of enamel. Decalcification may take two forms. The less common type is surface erosion. The more common type is subsurface decalcification which results in loss of enamel structure beneath an apparently sound surface layer and leads to an early carious lesion. It is believed that subsurface decalcification is more common because of the surface pellicle present on virtually all tooth surfaces and because of the protective effect of the higher fluoride content of the extreme surface layer of enamel. After subsurface decalcification has progressed it becomes visible as a "white spot" when the teeth are dry.

In general, dental caries may be described by a simple equation representing the Miller (acid) theory.

$$\text{Food} + \text{Bacteria} = \text{Acid} + \text{Tooth} = \text{Caries}$$

These factors may be likened to the links of a chain. If any one were removed entirely, caries would not result. Obviously, this is a very impractical approach. The use of fluorides, however, to strengthen tooth enamel against acid attack is a promising addition to the armamentarium of preventive dentistry.

Fluoride therapy has two forms: systemically, the addition of fluoride to developing tooth enamel and, topically, the application of more concentrated fluorides to the erupted teeth. Systemic uptake of an optimum quantity of fluorides by developing enamel results in about 5% of the enamel structure being formed probably as fluorapatite, $\text{Ca}_{10}(\text{PO}_4)_6\text{F}_2$. The topical application of concentrated fluorides such as stannous fluoride will result in the formation of calcium fluoride and stannous phosphates. On sound enamel this is primarily a surface phenomenon. Both forms of fluoride treatment protect enamel against acid decalcification and may retard acid formation by plaque bacteria.

The protective effect of topical fluorides is demonstrable *in vitro* by the acid etch test. Enamel treated with stannous fluoride resists a weak acid etch (0.1 N lactic acid, pH 5) to a much greater degree than untreated enamel. The acid etch test is primarily a surface erosion phenomenon. To study protection against subsurface decalcification, systems involving an organic polymer such as the agar-saliva system should be used. The protective effect of topical fluorides in solution or dentifrice form is also demonstrable in animal caries studies. Of course, final proof must be in clinical studies under normal use conditions.

Recent clinical work suggests that multiple fluoride applications - topical solutions plus an effective fluoride dentifrice (Crest) - produce additive benefits and are also additive to the protection imparted by water fluoridation. The use of fluorides can play an important role in your program of preventive dentistry.

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Cavity Preparation

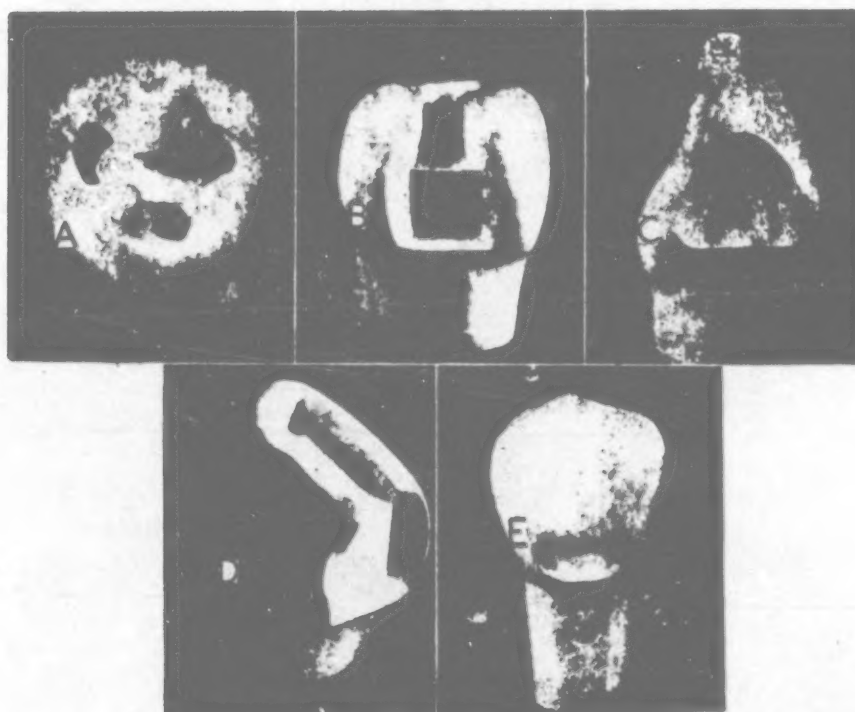


Figure 30. Examples of cavity classification. A, Class I. B, Class II. C, Class III. D, Class IV. E, Class V. (From Peterson, S., editor: Clinical dental hygiene, St. Louis, 1959, The C. V. Mosby Co.)

"Cavity preparation" is the term applied to the cutting operation performed upon a tooth to remove dental caries and to ensure placement of a restoration that will be strong, resist displacement, and prevent recurrence of caries. Cavities are identified by the surface or combination of surfaces of the tooth on which they occur, as follows:

Occlusal	O	Incisal	I	Mesio-incisal	MI
Mesial	M	Lingual	L	Disto-incisal	DI
Distal	D			Mesio-incisodistal	MID
Facial	F	Mesio-occlusal	MO	Facio-occlusal	FO
Labial	L	Disto-occlusal	DO	Linguo-occlusal	LO
Buccal	B	Mesio-occlusodistal	MOD		

Cavities are further classified according to the similarity of instrumentation employed in preparing them (Figure 30):

CLASS I Cavities in pits and fissures

CLASS II Cavities on proximal surfaces of premolars and molars

CLASS III Cavities on proximal surfaces of incisors and canines not requiring removal of the incisal angle

CLASS IV Cavities on proximal surfaces of incisors and canines requiring removal of the incisal angle

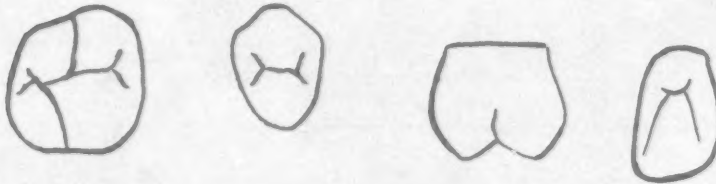
CLASS V Cavities on gingival third of facial and lingual surfaces

CAVITY CLASSIFICATION & PREPARATION

Although you will not be called upon to prepare teeth to receive the restorative materials, a basic knowledge of cavity preparations will help you understand the technics employed in the placement of these materials.

For purposes of grouping together cavities that require a similar type of treatment the following classification was developed.

Class 1. Commonly known as "pit and fissure" cavities; occur in occlusal surfaces of bicuspid & molars, lingual surfaces of upper incisors, occlusal two-thirds of buccal & lingual surfaces of molars.



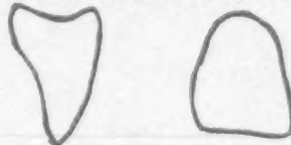
Class 2. Occur in proximal surfaces of bicuspid & molars.



Class 3. Those which occur in proximal surfaces of incisors & cuspids and which do not involve the incisal angle.



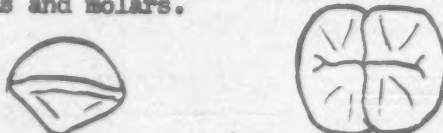
Class 4. Those which occur in proximal surfaces of incisors & cuspids and which do require the removal and restoration of the incisal angle.



Class 5. Occur in the gingival third of facial or lingual surfaces (but not involving pits).



Class 6. An unusual group occurring usually as a result of abrasion on the incisal surfaces of incisors or tips of cusps of bicuspid and molars.



PROCEDURE SHEET
DYCALPROCEDURE NO. _____
PAGE ____ of ____ PAGES

HOW TO MIX DYCAL BASE

INTRODUCTION:

Dycal makes calcium hydroxide available, to the dental profession, in a rigid, self-setting composition to serve as a base in deep cavities. Its rigidity in the tooth provides a solid foundation, requiring no additional support from zinc phosphate cement prior to placing either a composite, an amalgam or a resin filling.

Its content of calcium hydroxide supplies an effective procedure for maintaining the vitality of pulpal tissue in cases of exposure or near exposure.

Dycal consists of two components: a Base paste and a Catalyst paste both of which are supplied in collapsible tubes for convenient dispensing and safe storing. Store under normal room conditions.

MATERIALS REQUIRED:

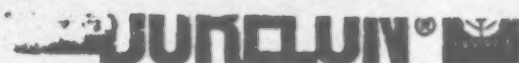
Dycal base	small paper pad
Dycal catalyst	small ball-burnisher
small spatula	

PROCEDURE:

1. Dispense exactly equal lengths of both pastes upon the paper pad provided.
2. Start stirring immediately, using the small spatula. Mix thoroughly for uniform color dispersion.
3. As a general rule, to provide the maximum working time, you should complete the mixing of the two pastes within 10 seconds.
4. Then quickly hand the dentist the small ball-burnisher and mixed "Dycal".
5. Mixed material will set in about 2½ minutes on the mixing pad under normal room conditions (70°F. with 50% relative humidity), and 1 minute in the mouth due to moisture and temperature

IMPORTANT:

1. Don't attempt to control setting time by increasing or decreasing the amount of catalyst dispensed.
2. The technic for handling Dycal cannot be precisely charted. Experience will quickly guide you in adjusting the details of the operation for satisfactory performance.
3. Dycal, due to its water solubility, should not be used as a temporary filling.



for Cementations and Cement Bases

Directions for Use

General Considerations

A mixture of DURELON powder and liquid appears to be thicker than conventional cements. Actually, though the viscosity and tackiness is greater, the film thickness is far lower than practically all other cements.

Materials to be cemented to tooth structure will go to place with a minimum amount of displacement pressure. Raised bites are hardly possible when DURELON is the cementing medium.

DURELON is adhesive to tooth structures and stainless steel only so long as the mix is glossy.

Do not use the DURELON mixture when it has lost its sheen.

For maximum adhesion tooth surfaces and items to be cemented must be clean and free from contamination by oily materials, wax, saliva, or medicaments. Wash freshly cut tooth structure with water and wipe dry with a cotton pledget. Absolute dryness is not critical.

Wash gold alloy castings after try-in with water than alcohol and flame. Place the cement on the tooth and the object to be cemented while the mix is glossy.

Remove excess cement preferably before complete set, but it is essential to keep area dry until DURELON has become completely set. DURELON contains no phosphoric acid, and will produce practically no cement shock. Its low solubility, and its virtual freedom from producing palpal irritation are extremely beneficial characteristics.

Dosage with powder measure and drop bottle

POWDER



Tap DURELON powder bottle 2 or 3 times on the table to make the powder more compact.



Press supplied measuring stick down into powder. When withdrawn from bottle, remove excess powder from stick. Powder should be flush with end of stick.



Release the powder onto the DURELON mixing pad or a glass slab by tapping the measuring stick with a spatula.

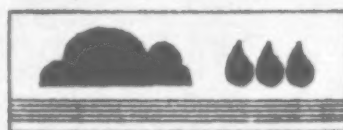
LIQUID



Hold the bottle in vertical position and squeeze. Release pressure when the drop separates from the nozzle. Thus small and uniform drops are obtained.

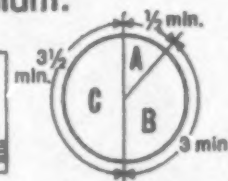
The resultant mixtures obtained by this method will be approximately correct. The ratio need not be exact because of the wide latitude in ratio permitted by DURELON.

As a Cementing Medium:



Use 3 drops of DURELON liquid to 1 measure of powder

If larger quantities of cement are required, use multiples of the given proportion.



The time wheel indicates times of manipulation of DURELON when it is used as a cementing medium.

- a) Spatulation time not to exceed 30 seconds.
- b) Manipulation time up to 3 minutes.
- c) Setting time in the mouth $3\frac{1}{2}$ (approximately) minutes.

The ratio recommended is $1\frac{1}{2}$ to $2\frac{1}{2}$ parts of powder to 1 part of liquid by weight. Temperature of room and slab is 73° F. When more powder is added and the temperature is increased, manipulation time and setting time are shortened.

The ratio of powder and liquid can be approximately judged by discerning the volume of each. Remember, exact proportions are not critical.

Place powder and liquid on DURELON Mixing Pad (a glass slab can also be used).

Do not use thin parchment mixing pads. Use a flexible stainless steel spatula. Use spatulation technic that involves placing most of the powder mass into the liquid at one time. Add subsequently smaller portions of powder until the desired consistency is reached. The mixing should, however, be completely accomplished within 30 seconds or less. The resultant mixture is to be manipulated only so long as it is shiny and glossy.

As a Cement Base:



Use 2 drops of DURELON liquid to 1 measure of powder

Even more powder may be added until mass is thick and firm. Remember, however, that mix should take place within 30 seconds and the mass should be used while it is glossy for maximum adhesiveness.

To facilitate the adapting, the instrument may be dipped in DURELON powder or in alcohol.

As a Vehicle for Tooth Sedation:

If tooth sedation is required, place calcium hydroxide, eugenol, thymol etc. into the tooth preparation and place DURELON over the medication. This, however, will eliminate the specific adhesion characteristic of DURELON. In such a case DURELON will stay in place, as conventional cements do, by mechanical locking only.

An alternate method would be to add a small droplet of eugenol into the DURELON mixture. This will not materially affect the characteristics of DURELON, may, however, reduce adhesion.

Special Note to Orthodontists:

Inasmuch as DURELON chemically combines with enamel and with stainless steel, the adhesiveness obtained is far greater than with conventional cements.

DURELON is also less brittle than conventional cements. To obtain the maximum adhesion, clean both the bands and the teeth with pumice and water, cut film tension with alcohol, and air blow the surfaces dry. This great adhesiveness, however, will not result in marring the enamel on removal. The adhesiveness is purely a surface combining, and the bond can be destroyed by a sharp and forceful tug. DURELON prevents decalcification of enamel.

Reports from clinicians and laboratory research projects indicate that DURELON is especially adaptable to usage with brackets made of stainless steel, instead of circumferential bands. For those who wish to use this bracket cementation technic, please write to PREMIER for special tooth preparation instructions.

The DURELON liquid should be dispensed only when required, immediately before mixing. Exposure to air leads to loss of water. It is advisable to wipe the mixing spatula and instruments clean with a wet tissue under running water immediately after use and before the material has set. Once DURELON has set, it can be removed with a 10% sodium hydroxide solution.

Sole distributors for USA
Premier Dental Products Company
Philadelphia, Pa 19107

Made in
Western
Germany by
ESPE GmbH



BERKS VOCATIONAL-TECHNICAL SCHOOL - EAST

DENTAL ASSISTING

OPERATION SHEET

OPERATION NO. 10

HOW TO MIX ZINC OXIDE EUGENOL CEMENT

INTRODUCTION:

A sedative, medication, temporary filling, used for a tooth. Can be used in crown and bridge procedure for temporary cementing, as a protective covering over prepared teeth. Used as a sedative cement (treatment). Also as a base under metal restorations and for capping exposed pulp.

Eugenol is a liquid that smells like cloves and olive oil.

MATERIALS:

Parchment Pad
Steel Spatula
Zinc Oxide Powder

Eugenol in dropper bottle
Plastic Instrument

INSTRUCTIONS:

1. Place 5 drops of eugenol on one end of the pad
2. Place 5 times the bulk zinc oxide powder at the other end (about the size of a quarter)
3. Liquid will hold much greater quantity of the powder than seems likely.
4. Add about twice the volume of powder as you have liquid, spatulating well into a smooth mix.
5. Then add smaller portions, mixing thoroughly until mix is heavy and putty-like.
 - a. does not harden rapidly
 - b. can be prepared in advance:
 1. zinc acetate crystals hasten setting
 2. small amount of vaseline slows setting
 3. moisture helps in setting
6. To make the temporary filling stronger, a few cotton fibers can be mixed in the material.

INFORMATION SHEET
DENTAL CEMENTS

NO.

DENTAL CEMENTS

Dental cements are one of the few dental materials that were developed exclusively for dental use. Most of the other dental materials such as gold, silver, porcelain, were adapted for dental use from other fields.

The dental cements in use today may be classified under these headings.

1. Zinc oxide eugenol
2. Zinc Phosphate
3. Calcium Hydroxide Cements
4. Silicate Cements
5. Direct filling resin or resin cements

ZINC OXIDE EUGENOL CEMENTS

Powdered zinc oxide mixed with eugenol, which is the active principle of oil of cloves, sets slowly in the presence of moisture. Generally the zinc oxide eugenol cements we encounter in the dental office consist of zinc oxide, rosin, which acts as a hardener, and small quantities of zinc acetate, which accelerate the setting time. Zinc oxide eugenol is used as a protective cavity lining. It may be used for a temporary filling or a sedative dressing in the case of an irritated pulp. It is used for root canal fillings. It can be used for pulp capping, and as a temporary cementing medium for crowns and bridges. It is also used as a periodontal pack or a dressing for gingival surgery or inflammation of the gingiva. Zinc oxide eugenol is usually mixed on disposable parchment pads.

eugenol: a liquid which smells like cloves and olive oil, colorless, aromatic liquid.

uses: medicated, sedative, temporary filling, to allay pain in a tooth. Usually do to the tooth being ultra-sensitive and it acts as a tranquilizer to help the tooth from hurting.

1. short life treatment filling to allay pulpal irritation
2. base or liner in deep cavities (thermal insulator to pulp)
3. pulp for exposed pulps under metallic restorations.
4. temporary filling or covering of exposed dentin in prepared teeth

mix: place powder the size of a quarter on a parchment pad. Add 5 drops of liquid next to the powder. * NEVER MIX ON A GLASS SLAB

test: cut mix in half with spatula, shouldn't be able to spread it. It can be mixed in the morning and good for all day. It will not set till it comes in contact with moisture - then it will set up.

INFORMATION SHEET
DENTAL CEMENTS

NO.

zinc oxide eugenol (cont'd)

delay setting: mix in normal way - dry off tooth - place the material in the tooth and coat with vasoline. The coating protects the ZOE from the moisture, and delays the setting.

hasten setting: mix mixture with water
mix zinc acetate crystals

to make a stronger temporary filling: mix in a few cotton fibers temporary remains from 1 day to 6 months. Depending on how severe the damage or how long the laboratory work takes.

ZINC PHOSPHATE CEMENTS

Zinc phosphate or zinc oxy-phosphate cement, as it is sometimes called, is used for a cavity lining. It is used for permanent cementation of bridges and crowns, and it is also used as a base under other metallic fillings. It consists mainly of zinc oxide powder to which is sometimes added a little magnesium oxide. Other metallic oxides are added to change the color of the cement. The liquid is a solution of orthophosphoric acid and water, which has been partly neutralized by the addition of aluminum hydroxide, zinc oxide or magnesium oxide. Cement liquid consists then of orthophosphoric acid, water and various metallic phosphates.

The water content of the cement liquid is rather critical. More water in the liquid will cause the cement to set more rapidly, less water slows down the setting time, it is important to keep the bottle tightly capped at all times, because in a dry atmosphere water will evaporate, and in conditions of excess humidity the liquid will pick up water from the air.

The mixes for oxy-phosphate cements vary according to use of the finished mix. Mixes for cementing appliances are made rather thin, mixes used as temporary fillings or as cement bases under metallic fillings or inlays are mixed thick. Saliva or moisture in contact with a mixed cement in the mouth will leach out part of the liquid and cause a weakness in the finished product. It is therefore desirable to keep any cement placed in the mouth dry until it is set.

Zinc phosphate is called a "hygroscopic material".

used: for cementing inlays, crowns, bridges, jackets, orthodontic bands & facings onto teeth (anything on a permanent basis) or as a base under metallic restorations.

INFORMATION SHEET
DENTAL CEMENTS

NO.

zinc phosphate (cont'd)

Two consistencies:

- | | |
|--------|---|
| cement | 1. mix: athin, creamy, molasses consistency like Elmer's glue. |
| base | 2. mix: extremely thick, heavy, putty-like. Used for a base under a restoration. <u>Base</u> used as a thermal insulator. |

Mix:

on a glass slab, cooled, stainless steel spatula.
put powder the size of a penny out at one end. Divide the powder in halves, into 1/4, two quarters into 1/8, two eighths into 1/16. Add 8 drops of liquid on the slab.

Add the smallest portions first, mixed in a flat figure 8 motion. Covering at least 1/2 of the entire slab. Mixing for total time of 120 seconds. Mix till reach the consistency. Slab, spatula and patient's tooth must be dry, cause moisture dissolves material.

delay setting:

spatulate 1 pin head of powder in the liquid and let stand for 1 to 2 minutes. Then continue the technique.

hasten setting:

rapid spatulation, heat, large quantities or mixing in a small area.

test: (for proper consistency)

cement: gather it up, pull spatula up and it will follow, but fall into a puddle.

base: it breaks from the spatula in jagged edges.

This material has a violent chemical reaction between the liquid (phosphoric acid) and the powder (zinc oxide). Therefore always mix on a cooled glass slab, over a large area of the slab in a figure 8 motion.

Wash the material off the spatula and glass slab immediately with cold water and an instrument brush. If the material is allowed to set (harden) it is very hard to remove and will ruin the instruments.

INFORMATION SHEET
DENTAL CEMENTS

NO.

COPPER PHOSPHATE CEMENTS

Copper phosphate cements are rather like zinc phosphate cements in their setting reactions and the liquid is orthophosphoric acid. The powders contain various copper oxides or copper salts and they vary in color depending on the salt or copper used to make the powder. They are considered to be bactericidal in action in the tooth. They are used principally for filling cavities in deciduous teeth where all the decay cannot be removed. Black copper oxides cements do set much better and much harder in the presence of saliva or moisture than does zinc phosphate cement. As a result, they are sometimes used for cementing fracture splints or orthodontic appliances.

SILICATE CEMENTS

Silicate cements are sometimes called "synthetic porcelain" or artificial porcelains. Although they do match tooth structure very closely in color, they are otherwise not similar to porcelain in formula or physical properties. Silicate cements are furnished by the manufacturer as a powder and a liquid. The powder consists mainly of silica and aluminum oxide, together with various fluxes and coloring oxides. During manufacture the powder is fused at a temperature of about 1400° C., cooled and ground to a fine powder.

Silicate cement liquid is somewhat similar to that for the zinc phosphates. They are less acid, more of the orthophosphoric acid has been neutralized by combination with oxides to form soluble phosphates. The liquid usually also contains a little more water than phosphate cements.

One word of caution. Each manufacturer's formulations are slightly different, and it is not wise to attempt to mix the liquids of one brand of silicate cements with the powder of another. In addition, silicate cement liquid should never be used to mix with zinc phosphate powder. Setting time would vary widely and proper physical properties of the materials would not develop to their full extent.

The same precautions apply to the care of the liquid for silicate cements as for phosphate cements. In as much as it contains more water, the water will evaporate more readily from silicate liquid in a warm, dry atmosphere. The stopper should always be kept in the bottle, except at the exact time of use. In addition, the measured amount of liquid should not be left on the slab for any appreciable time before mixing. If you notice any crystallization on the walls of the liquid bottle, loss of water has taken place and the bottle should be thrown away.

Silicate cements when first inserted are almost undetectable. However, all silicates contract on setting, and a fine line develops between the cement and the cavity wall. After the filling has been in place some time, a dark line usually appears on the filling. In addition, silicate cements are relatively soluble in water. In the mouths of certain patients silicate cements will fail; in other patients silicate cements last for a period of years. It is impossible to predict the life of a silicate cement filling.

INFORMATION SHEET
DENTAL CEMENTS

NO.

Silicate (cont'd)

Uses: As a restorative, tooth colored material, for Classes III and V. Cannot be used in other classifications because they do not have edge strength.

Mix: Best to have a cool, dry glass slab. Temp. 68° F. Although the mixing range is from 65° - 75° F. If the slab is too cool, the moisture in the air will condense on the surface (dew pt.)

2 wells of powder
1 drop of liquid

divide the powder like phosphate, only backwards. Use 1/2 of the powder first, then add the smaller portions till a sticky, yet roll-able substance is obtained.

Test: bang the mix with a spatula and moisture will form around where the spatula has hit.

Mixing technique:

Do not smash the powder particles. Use a folding motion and only wet the powder particles. If the powder particles are smashed, the mix will be weak. Mix in a small area.

Mix for 45-60 seconds in a rotary, folding motion.

1 minute to mix
1 minute to place
3 minutes to set - under pressure

" MIX IT QUICK AND MIX IT THICK"

Silicate is very irritating to the gingival tissue and tooth, due to the phosphoric acid. Put a cavity liner or varnish in the cavity prep 1st. Capolite is a cavity varnish, it seals the dentinal tubercles. It contains fluoride. Silicate is a weak material and gradually dissolves away "washes out", has a 3-5 year span. Today, silicates are not used to the extent years ago, they have been replaced by Composites.

Some commercial brands very popular today:

COMPOSITES

Adaptic by Johnson & Johnson
Smile by Kerr
Concise by 3M
Prestige by
Natural by Borworth Co.
Cervident by S.S. White Co.
Restodent by Lee Pharmaceuticals

CALCIUM HYDROXIDE CEMENTS

While not strictly cements, calcium hydroxide compositions of one kind or another are used in deep cavities of the teeth to protect the pulp. A calcium hydroxide cement will be placed just over the deep portion of the cavity or the exposed pulp. It has been found that the calcium hydroxide has a beneficial effect on the pulp of the tooth and stimulates the growth of secondary dentine in the pulp chamber. Calcium hydroxide cements consisting of synthetic resins and chloroform may be used. These ingredients make the cement more adhesive and improve the strength. Because of its low strength, the calcium hydroxide cements are usually covered with a layer of oxy-phosphate cement. A metallic filling is then inserted over this double layer.

CaOH is a pulp capping agent, used when there has been a pulp exposure. The dentist teases the material into the exposure.

CaOH does the following:

1. irritates the tooth to a point where it forms secondary dentine. Secondary dentine is extra hard, tuff, dense, dentine (a callus of tooth structure)
2. seals the dentinal tubercles (rods)
3. neutralizes the acidity of the restorative material
4. only a base - tooth then filled with ZOE or zinc phosphate.

The chemical CaOH is sometimes present in cavity liners, such as:

Hydrex, Dycal, Hypo (just some commercial preparations)

ACRYLIC CEMENTS

Acrylic cements are self curing acrylic powders which are mixed with liquid on a slab. The powder is very finely ground. They usually contain a portion of inert filler which makes the mix much smoother. They are very sticky and tacky when mixed. They often provide better adhesion for the cementation of facings to bridges. They are so sticky that there is often a certain amount of difficulty in removing the excess dried cement from margins of a crown or an inlay after it has been set.

Acrylic is an esthetic, restorative material, used in Class IV. It is esthetic because it comes in shades, which can be matched to the shade of the natural tooth, by use of a shade guide.

Liquid is monomer, and the powder is polymer. The chemical name for the acrylic methyl methacrylate.

INFORMATION SHEET
DENTAL CEMENTS

NO.

Acrylic (cont'd)

Two techniques of placing acrylic:

1. Pressure Technique:

Mix the powder & liquid together in a dappen dish or on a glass slab with a stainless steel spatula and mix the polymer & monomer to a sticky consistency. The material is placed and condensed into the cavity prep and held under pressure with some type of matrix either a celluloid matrix strip or by filling a celluloid crown form and forcing this over the tooth.

2. Brush - in or Paint - on Technique:

With this method, 2 similar shades of powder are chosen, each placed in a separate dish, and a dish of liquid. A small sable paint brush is used to dip into the liquid, then into one of the powders, into the cavity prep. Then, into the liquid and the other shade of powder, into the prep. This procedure is repeated over and over until the cavity prep is over filled.

Advantages:

1. it is esthetic
2. easy to insert
3. little acidic
4. stains less than silicate
5. it does not "wash out" - has longer life than silicate
6. edge strength

Disadvantage:

- * it has excessive shrinkage and expansion, therefore it cannot be used in a Class III or V.

GUTTA PERCHA

Gutta percha is a gum of an East Indian tree, which is prepared for dental use by mixing with mineral fillers. It is used for temporary fillings. It is manipulated by the use of heat. The dentist warms a bit of gutta percha over a flame. He then presses the gutta percha to place in the cavity. It is then trimmed with hot instruments to seal it in place.

Gutta percha is also called Temporary Stopping. Although it is used, it is not a satisfactory temporary filling material because of:

1. leakage, 2. teeth become sensitive because of resulting pulpal irritation,
3. does not adapt well to tooth structure, 4. great marginal leakage.

BERKS VOCATIONAL-TECHNICAL SCHOOL - EAST

DENTAL ASSISTANT

OPERATION SHEET
DENTAL CEMENTS

OPERATION NO. 9

HOW TO MIX ZINC PHOSPHATE CEMENT

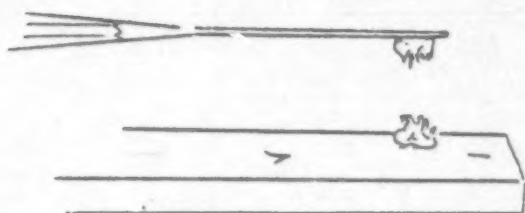
INTRODUCTION:

Hygroscopic material, and a permanent cement. This is used as a base under restorative materials or for cementing crowns, bridges, inlays, and porcelain jackets, and orthodontic bands.

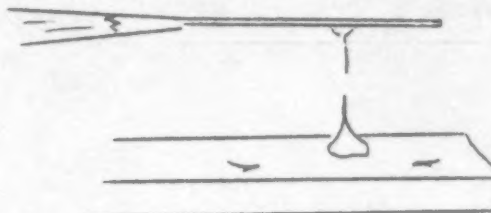
The consistency and setting time varies according to the purpose.

Base - thick and putty like consistency (thermal insulator)

Cement - creamy, will follow the spatula in a thin molasses like line without breaking momentarily, like Elmer's glue.



base consistency



cement consistency

MATERIALS:

Alcohol
Zinc Phosphate Powder
Zinc Phosphate Liquid

TOOLS:

Thick Glass Slab
Cement Spatula
Plastic Instrument
2 x 2 Gauze Sponge

PROCEDURES:

1. Place the powder on the slab near one end, about the size of a penny.
2. Divide the powder into halves, and then again into fourths. Move the portions far enough apart so that later, during mixing each portion can be moved into the mix without contaminating the remaining portions. Divide two of the quarters into eighths, then one of the eighths into sixteenths.
3. Dispense the recommended number of drops (3-4) on the other end of the slab. Keep the liquid bottle tightly closed, since the liquid picks up liquid from the atmosphere.

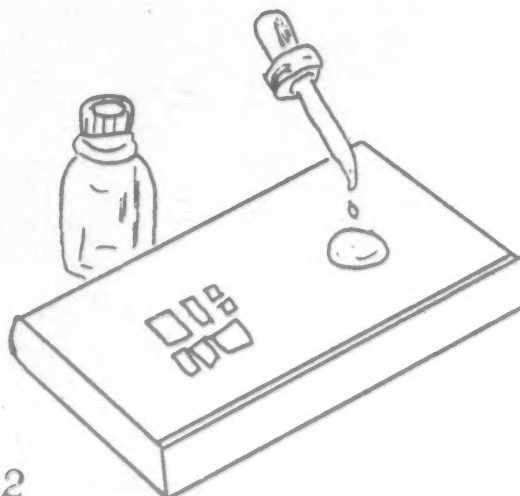
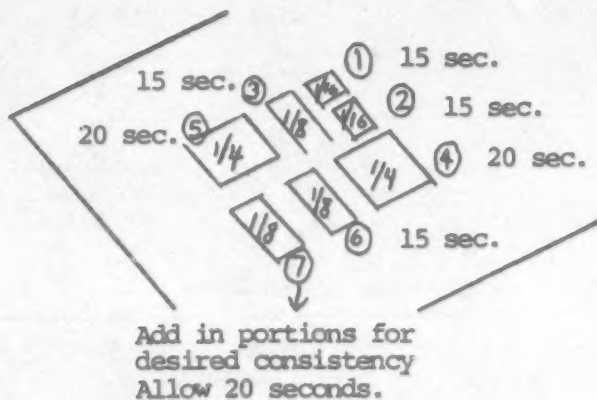
OPERATION SHEET
DENTAL CEMENTS

OPERATION NO. 9

4. Spatulate one of the sixteenth portions into the liquid for 15 seconds. In mixing, use half or more of the surface of the slab, to dissipate the heat created by the chemical reaction of the cement. Hold the spatula blade flat against the slab using a rotary motion. Incorporate another 1/16th for 15 seconds; 1/8th for 15 seconds; 1/4th for 20 seconds; 1/8th for 15 seconds; 1/8th for 20 seconds; Total mixing time: 120 seconds (2 minutes).
5. Never add liquid to a mix. Make a new one.
6. Certainly never reach in the powder bottle for more powder with a wet spatula.
7. Discard any unused powder on the slab, as it may be contaminated from the mix.
8. Place the cement on the side of the slab with the spatula ready for the doctor's use.
9. Prolong mixing lengthens the setting time, and the thicker the mix shortens the setting time. Setting time is not less than 4 minutes and not more than 10 minutes.

MIXING SCHEDULE OF ZINC PHOSPHATE CEMENT

Total mixing time: 120 seconds.



PROCEDURE SHEET
PLASTER OF PARIS

PROCEDURE NO.

HOW TO MIX PLASTER OF PARIS
(GYPSUM PRODUCT)

INTRODUCTION:

The transition (change) of the soft mixture of plaster of Paris with water to a hard, "set" material is a controllable process. That is, the time required for the transition may be altered by various means. Cold water used for the mix will delay setting - warm water will hasten it. Adding a pinch of salt will hasten setting, as will the addition of powder made by grinding previously "set" plaster. "Spatulation" helps to hasten the setting, other conditions being the same.

MATERIALS:

Plaster bowl
Plaster spatula
Water measure
Plaster of Paris

Six-inch-square tile
Vibrator
Scoop for powder
The impression to be poured

MIXING PROCEDURE:

1. For an average single arch impression, 40ml of water will be ample. This amount of water is poured into the bowl, using coldest water possible to provide the greatest amount of time in which to work.
2. Fill 4 scoops of powder, leveled off. Put into the bowl of water, and close the lid to the powder container immediately. (Plaster is hygroscopic and will become contaminated if left uncovered). This point should be reached without wasting time.
3. The spatula is then used to stir the mix thoroughly, attempting to incorporate as little air as possible into the mix. Spatulate until the mix of plaster is smooth. If you spatulate a thin mix long enough, it will begin to thicken - because it will be starting its "initial" set. This stage is too late to pour the cast well.
4. When the mix is at the desired consistency, place the plaster bowl on the vibrator, and vibrate well to remove as many entrapped air bubbles as possible. The material is then ready to use.

PROCEDURE SHEET
DENTAL STONE

PROCEDURE NO.

HOW TO MIX DENTAL STONE

(GYPSUM PRODUCT)

INTRODUCTION:

Dental stone is widely used in dental offices and dental laboratories. There are two main types - Class I Stone -- Dental Stone, used for casts that need strength and Class II Stone -- Die Stone, used for making "Dies".

MATERIALS:

Plaster bowl
Plaster spatula
Water measure
Six-inch-square tile

Artificial stone
Vibrator
Scoop for powder
The impression to be poured

MIXING PROCEDURE:

1. For an average single arch impression 40ml of water will be ample. The water is poured in the mixing bowl.
2. Fill, to level, 4 1/2 scoops of the dental stone.
3. Spatulate the contents of the mixing bowl until a uniform, creamy mixture is obtained. Place the bowl on the vibrator, at a medium speed, to bring air bubbles to the top of the mix.
4. The material is ready to be vibrated into the impression.
5. For special care, rubber bowls should be rinsed with water, then inverted and shaken before the measured amount of water is placed in the mixing bowl. The surface of the rubber bowl will require a certain amount of water just to wet it, in working with stone. This may make a definite difference in the amount of water available for mixing with the stone.
6. Special forms of artificial stone are often used to make special types of casts and "dies" for indirect crown, bridge, or inlay construction. Specific instructions for mixing these special types accompany the material when purchased. These directions should be followed explicitly to secure the required results.

PROCEDURE SHEET
POURING A MODEL

PROCEDURE NO.

HOW TO POUR A MODEL IN GYPSUM

INTRODUCTION:

Impressions taken in impression plaster must be coated with a film of some material which will aid in separating the cast from the plaster impression material. The impression may be coated with tincture of green soap, or with a commercial separator made for this purpose, applied shortly before the impression is poured.

When pouring an impression in alginate, make sure there is no blood or an excess of saliva in the occlusal portion of the impression. If so, blot dry the impression. Be careful not to blow forceful air into the impression, this will cause distortion of the final cast.

MATERIALS:

Bowl of mixed plaster or stone
Impression
Plaster spatula

Six-inch-square tile
Vibrator

MIXING PROCEDURE:

1. When an impression is boxed and the material of choice has been prepared, the model is ready to be poured. The vibrator is turned on and the impression is placed on the vibrator.
2. A small quantity of the plaster or stone is picked up on the end of the plaster spatula. If the impression is an upper, the first addition of plaster or stone is made on the palate area, while the impression tray is held snugly in contact with the vibrator. For a lower impression, the material is added at one or the other end of the "U" shaped arch - the "heel" area. The plaster or stone will flow off the spatula even when the mix is a very heavy consistency.
3. Applied in small portions to the palatal area of the impression, the material will flow from the higher portion of the impression into the lower portions. When the impression has been partially filled with the plaster or stone, the remaining mix may be applied at the edge of the boxing material and allowed to flow down into the boxed impression until a satisfactory amount, to provide a base for the impression has been flowed in. The object in flowing the cast material into the impression is to prevent trapping air bubbles in the lower portions of the impression, especially when teeth are present on the cast, as well as to free any air bubbles which remain in the mix of plaster or stone.
4. The poured impressions should be given ample time to set thoroughly before separation is attempted. The average time required for the material used in your office will be indicated on the container in which it is supplied. The recommendations of the manufacturer should

PROCEDURE SHEET
POURING A MODEL

PROCEDURE NO.

(cont'd) 4.

always be complied with to insure the best results with the product. Excessive time is not recommended.

5. If boxing is not possible with an impression, the low portions of the impression are filled with the cast material, using the vibrator, as indicated above. When the impression has been filled to as high a level as possible, the remaining plaster or stone is placed in the center of a six-inch-square tile in the form of a mound. Care must be taken not to trap air. The filled impression is inverted over this mound of plaster or stone, and gently seated until the periphery (edge) of the impression has been adequately covered with the cast material. All excess material possible is removed from the slab with the plaster spatula. After six minutes on the laboratory bench, the impression with tray, cast material, and tile is gently submerged in water and left until set (when the impression material, such as the alginates, requires this form of treatment).
6. If no mechanical vibrator is available, the cast material may be flowed into an impression by the use of a serrated instrument handle played across the handle of the tray much like a violin bow is used on a violin. The serrations will create sufficient fine vibration to aid the flow of material.
7. Impressions taken in alginate or hydrocolloid materials must be treated according to the manufacturer's instructions upon completion of the pouring process. These materials otherwise absorb water from the plaster or stone, resulting in a soft, chalky surface on the finished cast, especially when more than one cast is to be poured from a single impression.

HOW TO TAKE AN ALGINATE IMPRESSION OF A MODEL

INTRODUCTION: Alginate is a non-reversible hydrocolloid material. It is widely used by dentists to take preliminary impressions in the mouth. It is not often used in the laboratory, except to duplicate a cast quickly or to make an index for a repair of some prosthetic appliance.

MATERIALS: Plaster bowl (rubber)
Plaster spatula
Impression tray
Plaster model - which has been soaked for 10 minutes.
Alginate powder measure
Alginate water measure
Paper towel which is damp

PROCEDURE:

1. Soak the stone model in the H₂O for 10 min. This can be done when you are gathering your supplies.
2. Place the water from one full measure vial supplied by the manufacturing company into the mixing bowl.
3. Add two level scoops full of lightly packed powder to the water in the bowl. Fluff the can first, do not weigh the powder, measure it.
4. Spatulate thoroughly by rubbing the material against the side of the bowl one minute. The finished mix should be like creamy cake icing. (homogenous)
5. Transfer the alginate mix into a pre-selected tray that fits the model, in the dental office the tray will be fitted to the patient's mouth.
6. Let material set under light finger pressure for eight to ten minutes.
7. Lift the tray and impression off the model by snapping it upward in the posterior region, to break the suction.
8. Look it over carefully and see if any air bubbles have been trapped around the necks of the teeth or in the deep occlusal grooves of the teeth.
9. Wrap the impression in a wet or damp paper towel until pouring it up in dental stone.

INFORMATION SHEET
FINISH STUDY MODEL

FINISH A STUDY MODEL
(SOAPED)

INTRODUCTION:

This procedure is used in a dental office where study models are important and used frequently. Orthodontists use study models during consultations with patients and parents - therefore the appearance of the models is important.

MATERIALS NEEDED:

model	soft cloth
trimmer	
buffalo knife	
silicon carbide (waterproof) sandpaper	

PROCEDURE:

1. Take and pour up an impression. When placing it on the base stone position the inverted tray and tip the anterior portion slightly up. Try to get the least amount of air bubbles as possible.
2. After the plaster is hard, and set; remove from the alginate impression and trim keeping all angles as sharp as possible.
3. Use a buffalo knife to trim the border left along the teeth.
4. Fill in any air bubbles with a thin mix of plaster. Let stand till hard.
5. Make sand paper and model wet. Run the model over the sand paper, keeping it flat on the counter till smooth. About 10 times.
6. After angles and boarder of teeth are smoothed off, let stand to dry.
7. When dry, soak models in a soaping solution with teeth down for 20 minutes.
8. After 20 minutes, take models out of the soap and rinse off the excess soap. Let stand to dry.
9. Use a soft cloth to shine up the model when dry.

NOTE: It is necessary for the model to have a thick base and stand flat and even on the counter. To aid in keeping the model flat, when inverting the tip of the anterior up a small degree.

Personal Oral Hygiene Instructions

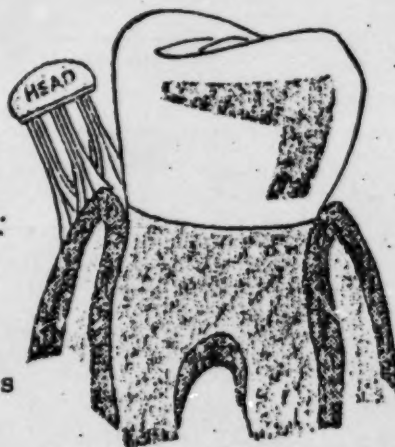
HOW TO STAIN BACTERIAL COLONIES — Place a stain (disclosing) pill in your mouth and slowly dissolve. Use your tongue to push the pill around the teeth so that it comes in contact with the fronts, sides, and insides of all of the teeth.

INSPECTION — Use a well-lighted mirror to examine your mouth. The bright red areas you see are the living bacteria which must be removed.

BRUSHING — Brush the red stained material away with short strokes, applying the tips of the bristles to the area with firm pressure, moving the toothbrush back and forth with a vibrating or circular motion. This will dislodge the soft stained material. A soft bristled toothbrush is less likely to injure tissues, yet flexible enough to reach into the frequently missed areas... particularly where the gum tissue (gingiva) meets the tooth. (See illustration and instructions below for proper brushing of this important area.)

HOW TO BRUSH THE AREA WHERE THE GUM TISSUE MEETS THE TOOTH

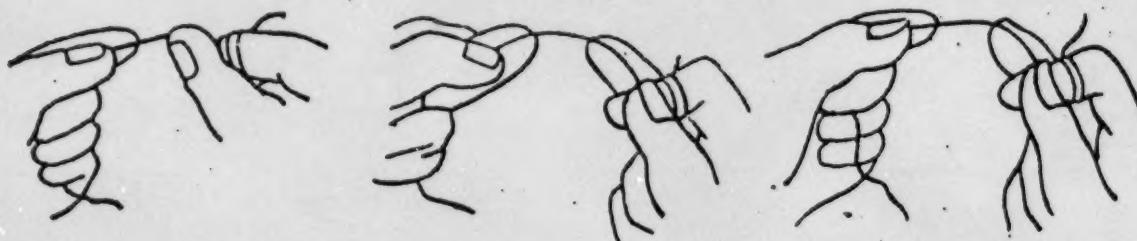
- ☆ Position half the bristles on the tooth and half on the gum tissue.
- ☆ Apply moderate pressure to the head of the toothbrush in the direction the bristles are pointing.
- ☆ Use slow, short back and forth strokes (not up and down) keeping the tips of the bristles in the same place.



FLOSSING — Only 3 out of 5 tooth surfaces can be adequately cleaned with a toothbrush. Dental floss must be used to clean the other tooth surfaces. Flossing should be performed at least once a day; preferably before going to bed.

FLOSSING (continued)

Cut off a piece of dental floss about two feet long. Wrap one end around the right index finger for anchoring or holding. Use the right thumb to hold the floss against the right index finger. Grasp the floss with the left hand so that a one inch length of floss is between the hands. Slip the floss between each pair of teeth by drawing it gently and slightly back and forth. Carry the floss under the gum until you feel definite resistance without discomfort... then scrape it up along the sides of both teeth. The following illustrations show how to hold the floss in the different areas of the mouth.



UPPER RIGHT TEETH

UPPER LEFT TEETH

ALL LOWER TEETH

RINSING — After cleaning all of the teeth with dental floss, rinse the mouth by forcing water vigorously back and forth between the teeth to remove the material that has been loosened or dislodged by the floss.

REINSPECTION — After brushing and flossing your teeth, re-examine them carefully. Any red stained areas remaining should be removed. Although it may not be possible to remove absolutely all of the stained material, it is important to reduce its thickness appreciably. By morning, all traces of the stain will be gone from the mouth.

— GENERAL INFORMATION —

It is important to remove the new growth of bacteria each day. Set aside a specific time... either after your evening meal or before retiring for cleaning, staining and thorough personal oral hygiene.

Your gums may become tender and bleed slightly during the first two weeks, but this will and soon, and the previously inflamed tissue will heal rapidly. In the future, no discomfort or bleeding will be experienced from any reasonable manipulations of the toothbrush or dental floss.

Stain the teeth every night the first week, then clean them to remove the stain. The second week, clean your teeth first then stain them to see if you've missed any areas. After you learn the correct personal oral hygiene method, the staining will be necessary only once a week to check yourself.

REMEMBER — Germs grow back every 24 hours... by using the stain pills, you know where they grow and live. You must remove them thoroughly every day, or the bacteria will accumulate in such large numbers that disease may result.

ORAL HYGIENE

TOOTH BRUSHES:

Everyone should have at least 2 tooth brushes. Each day should be started with a dry brush, because a wet and soggy brush is not effective. A worn or very ragged brush is also of little effect. A tooth brush should remove plaque, food particles, from the teeth and massage the gingival tissues (gums). The desired stiffness of the brush should not be up to the individual, a soft bristled brush with bristles of the same height should be used. There are two types of bristles.

Natural bristles: these are not as plentiful as nylon and consequently they cost more. They take hold of the hard enamel surface and the superior cleansing is accomplished.

Nylon bristles: they are easier to clean, they do not become soggy, do not split or wear as easy and consequently they last longer.

Electric tooth brushes have been made safe and effective and have provided a convient method of effective toothbrush. The novelty alone has encouraged many to brush more often. This is especially true with children, who usually have to be forced to brush their teeth.

TOOTH PASTE & POWDERS:

Toothpaste seems to be more manageable, especially for children, however tooth powders are just as effective. Tooth paste will provide a pleasant taste and therefore encourages brushing. What the patient puts on the handle of the brush, is more important than what is put on the bristles. Wether you use a powder or paste, the teeth should be brushed promptly after eating meals and snacks to dis-lodge food particles which would lead to decay. After brushing, rinsing is extremely important to remove all the dis-lodged food particles in the oral cavity.

MOUTH WASHES:

Some people may like the clean, fresh taste of a mouth wash, such as Cepacol, while others might prefer the cininamin and cloves taste of a mouth wash such as Lavoris. Hydrogen peroxide or salt water are probably the most effective as any commercial product, but lack the pleasant taste. The main function of the mouth wash is to remove food particles from the oral cavity

Oral Hygiene

DENTAL FLOSS:

The use of either dental floss or dental tape, unwaxed is recommended each time you brush your teeth. The main function of dental floss is to remove food particles and plaque from between the teeth, since brushing those areas is very difficult. Tooth picks or any other sharp instrument, should never be used to remove food particles from between (interproximal) the teeth. A danger of injuring the gum (gingival) tissues is extremely great.

RUBBER STIMULATORS:

They are found, sometimes on the handle of a tooth brush, or they may come as a separate unit. They are flexible, rubber cones, used to massage the gingival tissues and often recommended for those patients with so called - "weak gums" to help increase circulation.

INFORMATION SHEET
PLAQUE CONTROL

INFO. SHEET #

PLAQUE CONTROL

Plaque control is a new phase in dentistry, which has been designed to help a patient maintain a clean, healthy mouth. The plaque control therapist has been introduced as a new auxiliary personnel, in some offices. Her job consists of training patients the proper toothbrushing technique, the proper flossing, along with educating the patient of the damages of plaque.

I. What is Plaque?

Plaque is a sticky, transparent bacterial colony consisting of three items, saliva, bacteria, and food debris. Bacterial plaque has two stages:

a. Soft Stage

When in this stage the bacteria is beginning to colonize. After colonization has begun, the bacteria secretes a sticky mucous to protect themselves. Food debris which is allowed to accumulate will quickly become part of the colony.

This soft stage of bacterial plaque will only remain about 24 hours. If the colony is broken up, the accumulation will be halted. The best way of attacking plaque while it is in the "soft stages" is by the use of a disclosing tablet solution which will expose the plaque and you will be able to remove it.

b. Calcified Stage or Calcified Plaque (CP)

In this stage, the colony has survived for 24 hours, has combined with salt from saliva and has calcified. When in this stage, the calculus is visible but one is unable to remove it with normal brushing or by the use of dental floss.

Calculus will lodge in the gingival margin occlusally (supragingival calculus) and in the sulcular area (subgingival calculus). Calculus varies greatly in color and hardness depending on how it has been allowed to build, diet and on the use of tobacco. Supragingival calculus is easily seen, the greatest accumulation is on the lingual surfaces of mandibular anterior teeth and the maxillary molars. Subgingival calculus is not easily visible but is found by probing. It is dense, hard and firmly attached to the surface of the teeth, and is green or black in color.

II. Removal of Bacterial Plaque

a. During the first initial preparation appointment (IP) the patient will be given plaque control (PC) instruction and the D.D.S. will remove all supragingival plaque, thereby giving the patient an ideal situation in which to begin PC.

INFORMATION SHEET
PLAQUE CONTROL

INFO. SHEET #

b. The patient is given instruction on the formation of plaque and how it will lead to periodontal problems and decay. Since plaque is transparent, there are three ways to show it... with a liquid disclosing solution, disclosing tablets, or with the plaque lite. The patient is given a disclosing method and insured that all teeth are stained. (Insure the patient understands that the tablet is only to find plaque not remove it.)

The patient is now given a "tour" of the mouth and plaque ridden areas are indicated. Various areas of the mouth are compared, contrasting the areas of good and bad plaque control. (Be sure and stress the importance of maintaining all areas equally well.) Before you instruct the patient, the flossing technique, go over their mouth for any problem areas. Where you might see an over-hanging amalgam, or tight areas between two teeth.

III. Dental Floss Technique

It is important to overall dental health the patient becomes proficient in the use of dental floss.

The purpose of dental floss is to remove plaque from interproximal areas and the sulcers. The use of waxed floss is not preferred because it is slippery and may slide over the plaque, or be dropped down and be trapped interproximally.

Wrap floss (about 12" to 16") securely around the third finger of both hands, the thumb, index finger and third fingers will be used to manipulate floss. A see-saw motion should be used to work the floss between the teeth. Just pulling the floss between the teeth, will cause it to be rammed down into the gum.

There are two surfaces of the teeth to clean, the distal of the front tooth, and the mesial of the posterior tooth. The floss is wrapped around the tooth and with an up and down motion the tooth will be cleaned properly. An important factor to remember, the floss must go under the gum, to remove the plaque. Care should be exercised so as not to cut the interdental papilla.

IV. Brushing

Only a soft bristled toothbrush is to be used because a hard bristled brush lacerates the gum area.

Place the brush at a 45° angle against the teeth. vibrate the brush back and forth till the bristles are under the free-gum margin, the pull down or up on the surface. On the lingual aspects of the lower arch, the patient may find it convenient to use the brush vertically. Two to three teeth should be concentrated on at one time.

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PLAQUE CONTROL

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Remember the primary object of PC is to remove all of the disclosed plaque formations.

V. Use of Floss on Crowns or Bridges

In many instances, extra appliances for PC will be necessary. In the case of a crown or bridge, usually patients are not able to manipulate floss around bridges. Therefore the use of ZON Dental Bridge cleaners (ZDB) or orthodontic wire cleaners are required. ZON(DBC) are used in areas where there is sufficient space for them to be threaded interproximally. When a patient has difficulty in threading ZON the looped orthodontic wire is used.

Floss is threaded through the opening, and then the needle is inserted and normal floss technique is accomplished.

Bleeding and tenderness will most likely occur during flossing. If this happens, tell patient that with adequate PC and the work the Dr. will do, bleeding will stop within two-three weeks, tenderness will also subside. If floss becomes torn, this is due to overhangs. If the tearing of the floss continues, the patient should have the restoration replaced by the Dr..

VI. Charting of PC Progress

The scale of the condition of the patient's mouth is as follows:

- 0 no plaque
- 1 1-5 surfaces have plaque
- 1A 5-10 surfaces
- 2 10-15 surfaces
- 2A 15-20 surfaces
- 2B patient cares and is trying
- 3 patient doesn't care

PLAQUE CONTROL PROCEDURE**1st TREATMENT: (VISIT):**

1. Tell the patient what plaque is.
2. Count the surfaces of the teeth with tarter.
3. Teach the patient how to brush and floss.
4. Ask the patient to chew the tablet (disclosing).
5. Count and show the patient where the plaque are on the teeth.
6. Have the patient brush and floss in front of you.
7. At the end of the treatment tell the patient to brush his teeth befor coming in next time.

2nd TREATMENT: (VISIT):

1. Talk to the patient, and ask him if he has had any problems or if he has any questions, etc.
2. Ask him to chew another disclosing tablet for you.
3. Go over the mouth with them and count the areas with plaque.
4. Again, have them brush and floss.

3rd TREATMENT: (VISIT):

1. Talk to your patient about any problems with brushing and flossing.
2. Place 2 drops of liquid under the tongue behind lower, anterior teeth.
3. It should be swished around the teeth. Rinse lightly.
4. Use the "PLAK-LITE" to show areas with plaque (these areas will show up with a yellow glow).
5. Point out these surfaces and tell the patient to concentrate on these areas. But, by the third time--all areas of his teeth should be clean.
6. Again check the appropriate spaces on your plaque chart.
7. Dismiss your patient with a final lecture on importance of maintaining good oral hygiene and continue what he has learned.

PLAQUE CONTROL
INFORMATION SHEET

MISCELLANEOUS FACTS to know about PLAQUE

1. More germs in your mouth than people in the United States. Organized clumps of bacteria are plaque. They are microscopic, therefore we stain them to see the colonies.
2. TWO diseases that cause tooth lose:
 - a) tooth decay
 - b) gingivitis (gum disease)
 } both are to be removed each day
3. Foods are rich in carbohydrates, mix with plaque and bacteria and turn to acid. During the time acid is present, the tooth surface dissolves. Without aid of brushing, it takes hours for saliva to wash this acid away. Repeated acid attacks - eat away tooth structure.
4. Regular meals contain carbohydrates, but one hour at breakfast, lunch, and dinner is okay if you brush afterwards. But, if trigger foods eaten between meals, there is a constant attack of acid.

Trigger Foods:

pie, cakes, breads, soda, sugar, jam, jelly, sugar candies, gum, cough drops.
etc.....

The amount of tooth decay is related to the amount of time of exposure to acid. Sticky foods held in the mouth - provide a longer acid attack.

5. Natural defense against acid is saliva. At night, there isn't as much saliva, more chance for decay to start. But, if you brush your teeth before bed, it removes food, bacteria, and acids.

Good Snacks:

carrots, celery, popcorn, cottage cheese, nuts, lunch meat, peanut butter.

* Tooth Decay Prevention: How Often Eat Trigger Foods *

ROENTGENOLOGYTHE DISCOVERY OF X-RAYS

In 1895 Wilhelm Konrad Rontgen, Professor of Physics in Bereria accidentally discovered X-rays while experimenting with Krook's Tube, looking for invisible light.

Further experiments:

1. Those rays or forms of energy could penetrate solid objects and acted the same as photographic equipment.
2. They caused a florescent screen to glow, but were not cathode rays.
3. More experiments to find the properties.

THE FIRST DENTAL X-RAYS

Dr. W. G. Morton

Dr. Edwin Kells

Used X-rays as dentists.

ELECTRICITY, RADIOLOGY AND ROENTGENOLOGY --- TERMS

1. Electric current - a flow of electrons from one point to another
 - a. direct - flows one way only (in car batteries)
 - b. alternation - flows one way and then the other way. (homes)
2. Ampers - (amps) the unit of current flow through a circuit.
milli-ampers - 1/1000 of an amp (measured by milli-amp meter.)
3. Volt - unit of pressure which forces the current through a circuit.
kilo-volt - 1000 volts (measured by a volt meter.)
4. Watt - unit of electrical power
5. Ohm - unit of electrical resistance
6. Radiology - study of radiant energy, X-rays, radium, and radioactive isotopes.
7. Roentgenology - study of use of X-rays in Dentistry and Medicine.
8. Electron - small partical of matter which is negative charged.
9. Ionization - the breaking up of energy into ions.
10. Cathode - minus end of X-ray tube
11. Anode - plus end of X-ray tube
12. X-ray - Roentgenology - invisible light rays which can penetrate solid objects and affect the film the same as visible light.

HOW X-RAYS ARE PRODUCED

X-rays are generated when a stream of electrons (e. Current) traveling from the cathode of an X-ray tube is suddenly stopped by its' impact on the tungston target of the anode.

PROPERTIES AND TYPES OF X-RAYSProperties

1. they penetrate opaque objects
2. they affect film the same as visible light
3. they can cause florescence of some chemical compounds
4. they can destroy or stimulate living tissue
5. they do travel in a st. line and can not be deflected.
6. they are invisible
7. they travel at the speed of visible light

TYPES OF X-RAYS ACCORDING TO DEGREE OF PENETRATION DETERMINED BY VOLTS

1. Low Voltage - soft radiation
10,000 - 20,000 volts
 2. High Voltage - hard voltage or hard radiation
40,000 - 90,000 volts
- In dentistry - up to 70,000 volts or 70 K.V.P.
70 kilo-volts peak
In medicine - up to 1,000,000 volts or 1,000 K.V.P.

PRODUCT OF X-RAYS

There are 2 important or essential things for production:

1. Electric current must pass through tube.
2. Cathode rays must be produced and converted to X-rays

Low voltage - heats tungston filliment of cathode and produces cathode rays.

High voltage - shoots or propels cathode rays toward anode target.

The cathode rays are propelled or shot toward the focal spot of the anode target, then stopped and X-rays are produced.

TYPES OF X-RAY TUBES

- | | |
|-----|--|
| old | 1. Gas tube - cathode rays produced from breaking up of gas. |
| new | 2. Coolidge tube - from burning of tungston filament (filiment in cathode) |

TYPES OF RADIATION

Radiation - X-rays - Roentgen rays

1. Primary - comes directly from focal spot of target of X-ray tube.
The Useful beam, the central ray, the direct ray
2. Stray - comes from other tube parts other than the focal spot.
3. Secondary - comes from objects from which x-rays are taken.
4. Scattered - a form of secondary radiation.

THE BEAM OF RAY

Primary beam - useful beam - central ray

The primary radiation which passes through the opening of the diaphram and through the cone.

CONE CUTTING

At an 8" target - film distance the diameter of the central ray is about 2 1/2" at the tip of the cone.

If the tip of the cone is not in the center of the film the primary rays will miss the film resulting in a transparency in that portion of the film

ROENTGENOGRAPHIC ACCESSORIES

1. Intensifying screens - device used to enhance or increase the photographic effect upon the film by x-ray there -by making shorter exposure time possible.
(all ready in the cassette in extra-oral films)
2. Fluoroscope - dangerous and not used in Dentistry. The object is placed between the x-ray source and the outline on the screen.
3. Diaphram - device which allows only the primary beam to come out of the X-ray head.
4. Long Cone Attachments - an extension cone which replaces the short cone

5. Film Holders - devices used to retain the film in mouth

DENTAL ROENTGENOGRAM - a photographic film representing a shadow - graph of dental tissue.

(The lightness and darkness depends upon the amount of rays exposed to the film by penetration through the object.)

1. Radio-opaque objects - resist or stop the rays aimed at them.
They appear clear and or white on finished film ex. Bone, metal, enamel
2. Radio-lucent - do not resist the rays aimed at them and appear dark on the finished film ex. soft tissue, rarified bone, silicate

X-RAY FILM

1. CONSTRUCTION

celluloid base with 1 or both sides covered with emulsion.
(gelatine impregnated with silver salts.)

2. TYPES OF FILM SPEED SINGLE OR DOUBLE EMULSION

Slow - emulsion on 1 side only
Medium - (radiatized) emulsion on both sides
Fast - emulsion on both sides
Lightening Fast - emulsion on both sides

3. DETERMINING EXPOSURE SLIDE - tube side is opposite of reading side

Slow speed film - 1 side only; shiny side reading side
All other film - tube side has the raised part of the dot.

4. TYPES ACCORDING TO PLACEMENT

Intra-oral - within mouth

Extra - oral - outside mouth (Topicographic view or Cross section
5 by 7 or 8 by 10 inches

INTRA-ORAL TYPES OF FILM

- #1 Standard adult periapical (around the root) 1" x 1 1/4"
- #0 Childs film (very small children)
- Bite wing film
- Occulsal film - big like a cracker - takes picture of all teeth

EIGHT PRIMARY FACTORS IN DENTAL ROENTGENOGRAPHY

1. Target Film Distance -

In the short cone or regular technique the T.F. distance is 8 in. When the tip of the cone is almost touching patient's skin the TFdis. is about 8 inches. The diameter of the central ray is about 2 1/2 inches.

2. Milliamperage - (quantity) MAS

Milliamperes seconds

In dentistry we use 10-15 MAS This is controlled by increasing or decreasing the MAS dial.

3. Voltage - quality of current

KVP--Kilo volts peak 40,000 -- 90,000 volts

40 -- 90 KVP

The higher the voltage, the greater the speed of cathode rays, the higher the penetration of the x-rays.

4. Position of Patients Head

For all intra-oral film except occulsal, the plane of occlusion of the teeth to be

x-rayed, must be parallel to the floor.
The mid-sagittal line must be vertical.

Upper jaw - The imaginary line from the tragus of the ear to the ala of the nose must be parallel to the floor.

Lower jaw - The imaginary line from tragus of the ear to the corner of the mouth must be parallel to the floor.

Chair placement - The seat horizontal with the back vertical and the headrest high on the head above the occiput.

The headrest arm parallel to the floor.

The light on the patient's mouth.

5. Placement, Position, and Retention of film

The tab of film toward the tongue.

Center the ray on area to be x-rayed.

Vertical for anterior

Horizontal for posterior

Bend as little as possible, especially along axis.

The patient holds the film

Upper jaw - The ball of the thumb on upper borders of upper side of film with fingers forced out on face. Left thumb on right.

Lower jaw - The index finger pressing on film on crowns of teeth making a fist of fingers, elbow held high

6. Angulation of the central ray - according to rules.

7. Time of exposure - according to type of film and patient.

8. Developing or Processing of film- (see p.s. Developing)

VERTICAL ANGULATION

Direct the central rays so that they are perpendicular to an imaginary line which bisects the angle formed by the plane of the film and the long axis of the tooth.

HORIZONTAL ANGULATION

Direct the central rays in between the proximal surfaces.

ACTION OF THE DEVELOPER

It affects only those silver salts which have been exposed to x-rays. It splits the halide element from silver salts, leaving a black deposit of metallic silver. Developer is alkaline.

ACTION OF THE FIXER

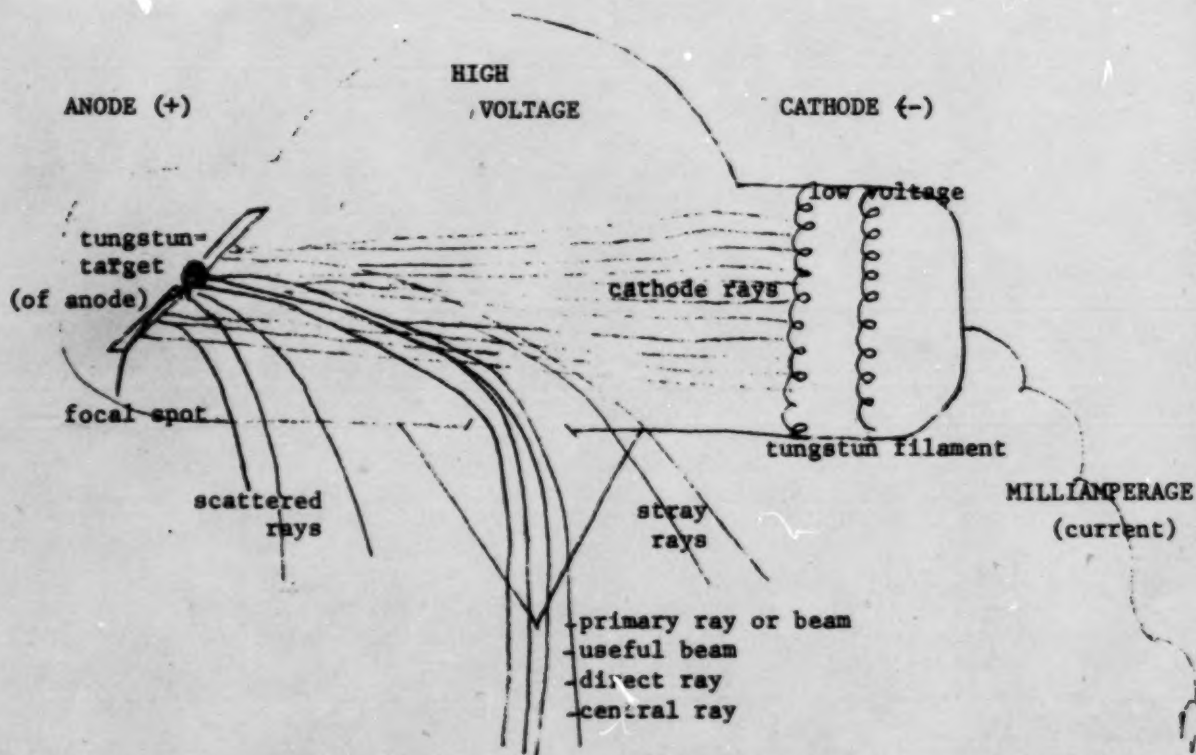
It affects only those silver salts that have not been exposed to x-rays. It dissolves the remaining silver salts and remove them from the emulsion;
The fixer is acid.

ROENTGENOLOGY

A. Parts of Machine:

1. head- moves very easy in every direction
2. cone- points at object being X-rayed
3. arm- main switch is located - forward (on)

B. Production of X-rays:



Turn on heat goes into cathode (-) and heats the tungsten filament, low voltage at this time. Cathode rays are produced. Push exposure button and cathode rays are propelled toward the anode side of X-ray tube (done under high voltage) If cathode rays strike a spot on the tungsten target of anode (+) it is the focal spot. If strike the focal spot - the rays come out - right angle as X-rays. If the cathode rays don't strike the focal spot they're bounced out at a wrong angle.

1. stray or scattered radiation - rays that come out at the wrong angle.
2. lead diaphragm - put across the cone (just inside) to stop stray or scattered radiation. With an opening for right angle rays to come out
3. secondary radiation - which has come through the object being X-rayed, and through the film and lead liner, continue going.

4. Two ways:

- a) long cone- don't have to be as accurate but use more radiation.
- b) short cone- less radiation.

5. Filter numbers:

- #1 filter- child size film
- #2 filter- (we'll use)
- #3 filter- occlusal film
- #4 filter- extraoral

C. Introduction;

- 1. Dentist: examines for carious lesions with X-rays- he can see contact areas but without X-rays- the decay is hidden.
- 2. Is evident that something more than eyes are needed to examine the mouth.
- 3. Radiographs (X-rays) been developed for routine exams.
 - a) conditions can't be seen without X-rays.
 - b) diagnostic aid- when showing roots crowns- gingiva.
 - c) dental radiograph- photographic records produced by the passage of x-rays through the tissue of the mouth to a film.
 - d) roentgen ray- electromagnetic radiation produced when electrons strike a metal target in a vacuum tube.
 - e) x-rays penetrate materials which absorb or reflect light because they have such a very short wave length.

D. 3 characteristics of x-rays- important to dentistry

- 1. penetrate many materials which either absorb or reflect lite.
- 2. can be seen on photographic film (they can take a picture)
- 3. can produce biological changes and even kill; thus, we must be exceptionally careful in using x-radiation.

E. X-ray tube consists of a cathode and anode.

- 1. cathode- a filament of tungsten wire inside a focusing cup which directs the electrons to the target on the anode side of the tube.
- 2. anode- a copper bar with a focal spot on it
- 3. focal spot- the area on the target which the electrons strike
- 4. electrons- minute particles of negative electrical charges which can be made to move rapidly. If electrons collide with a metal target at a high speed, x-rays or radiation are produced.
- 5. milliamperes- electrical term referring to the amount of electrical current being carried by the conductor
- 6. milliamperage- refers to the amount of current flowing to the x-ray head
- 7. Kilovoltage- controls the speed at which the electrons travel, which is very important to the quality of radiographs produced.
- 8. penetrating power- ability to pass through an object.

* electrons travel faster, gives greater penetrating power.

* denser the object - determines amount of x-rays absorbed and the amount allowed to pass through.

HOW DANGEROUS ARE X RAYS?

From Top Authorities Come Answers to Questions on Topics in the News

Today more and more doctors and dentists are calling for X rays as a routine part of any examination. On the other hand, the U. S. Bureau of Radiological Health recently issued strict rules to insure that Americans do not get overdoses of X rays from diagnostic equipment. What's the story—are X rays dangerous or not?

Even small dosages of X rays kill or seriously alter living cells in the body. But the body is in the business of making cells to replace those damaged as well as those which die naturally—and a small amount of X rays will probably do no permanent damage.

What is the worry, then?

Too much radiation can make cell damage and cell change irreversible. In laboratory tests, overdosage of X rays has been clearly implicated in some cancers and leukemias.

Furthermore, similar tests showed that, in the case of the male and female reproductive organs, even low dosage of radiation can result in damage to future children.

With these dangers in mind, experts in the field of radiology are worried that a great many Americans may some day soon be getting overdoses of X rays.

How could that happen if the dangers of overexposure to X rays are known?

As public-health authorities in the radiation field see it, there are three problem areas:

- Physicians and dentists are making greater use of X rays for diagnosis all the time, and neither they nor the patients are keeping records of all radiation exposures.

- A lot of X-ray equipment in use today is not really safe.

- There is no sure way of knowing how many Americans may be getting overdoses of X rays, not only in the course of diagnosis but also from nonmedical sources, such as TV, microwave ovens and sun lamps.

What, if anything, can be done to deal with these dangers?

In the matter of overuse of diagnostic X rays, medical schools across the country are alerting students to possible dangers.

At the same time, scientists at the

American College of Radiology are refining for doctors a list of conditions for which diagnostic X rays are essential as a preliminary to treatment, and those for which the procedure is not mandatory.

According to an ACR spokesman, the general feeling among specialists today is that use of X rays to pinpoint trouble spots in the body is still within



Use of X rays for diagnosis of illness is growing—and causing growing worry.

safe limits. But, this official also suggests, use of X-ray diagnosis is booming rapidly—perhaps dangerously.

Statistics from Government surveys support this view. In 1970—the latest year for which figures are available—Americans made 112 million visits to medical facilities for diagnostic X rays. They also made 68 million visits for dental X rays.

That was a 20 per cent increase in five years. All indications are that the boom is continuing, and that it is probably increasing.

Why is there such an increase at this time?

Improvements in equipment now make it possible for X rays to reveal more than ever before, and doctors thus are finding more uses for X-ray machines. Also, because of the growth of malpractice suits, doctors

are practicing “defensive medicine”—which means more X rays.

How much exposure to X rays is safe, and who decides the limits?

“There is no standard ‘safe dosage’ or exposure limit for radiation.” That’s the view of Lauriston S. Taylor, the physicist who is president of the National Council on Radiation Protection and Measurements, the organization chartered by Congress as watchdog in the whole radiation field.

Furthermore, says Mr. Taylor, such standards are both impossible and unnecessary.

“Reaction to X rays varies with the strength of the rays—measured in units called ‘rads’—the duration of exposure and the part of the body exposed,” he says.

“It is up to the doctor to decide on procedure, just as it is up to the surgeon to decide where and how deep to make the incision.”

A different view is expressed by John C. Villforth, director of the Bureau of Radiological Health. Says Mr. Villforth:

“All radiation is potentially harmful. In the case of diagnostic X rays, the doctor, dentist or technician taking them is only as good as his equipment. And a lot of equipment now in use is exposing patients to more radiation than they need.”

What should you do if you are worried that your doctor or dentist may be calling for too many X rays in your case?

The ACR suggests: (1) Tell the doctor or dentist how often, and for what purposes, you have been X-rayed in the past 12 months. (2) Ask him if, in view of this exposure, he believes additional X rays are advisable, and why he thinks so. (3) If his answers seem unsatisfactory, consult another practitioner.

All in all, just how serious is the danger from X rays today?

Experts such as Mr. Taylor and members of the American College of Radiology sum it up this way:

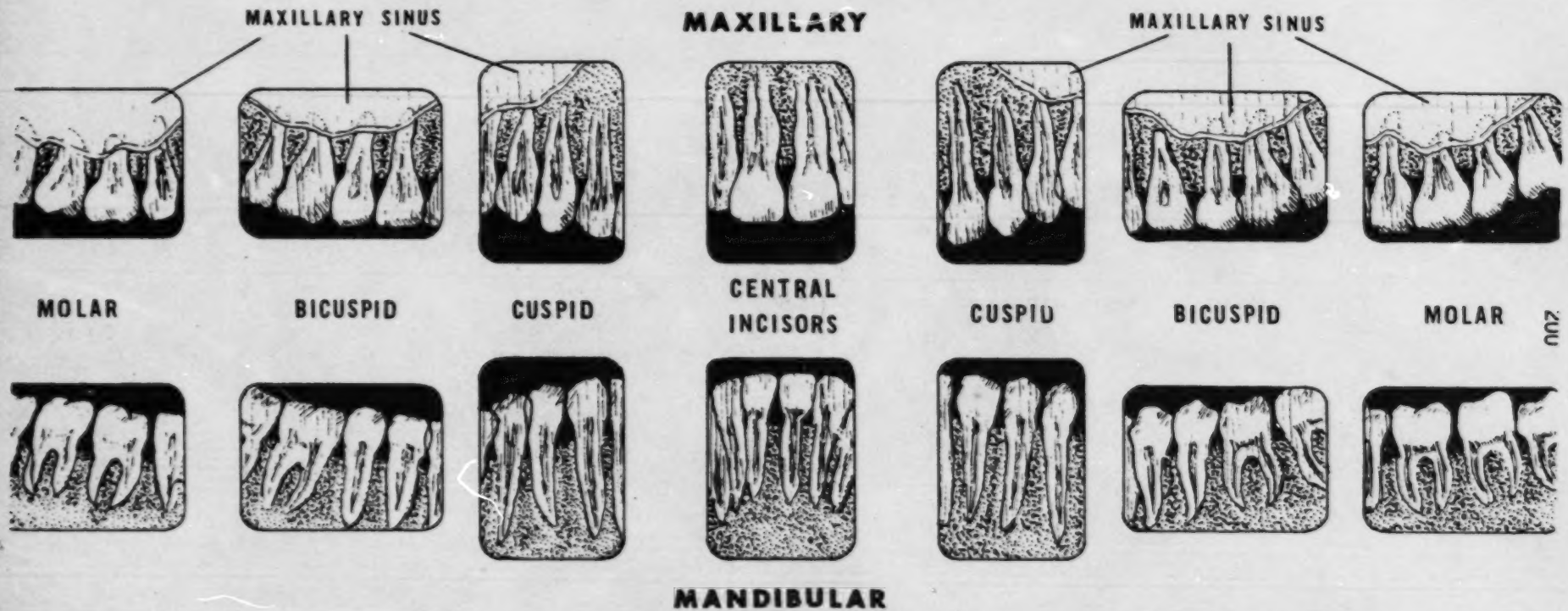
There is far greater risk to a patient from a faulty diagnosis than there is from current use of diagnostic X rays to get a proper reading on the patient’s trouble.

PROCEDURE FOR TAKING X-RAYS

- A. Seat patient- adjust chair
- B. Position unit head
 1. degree of angulation
 2. sagittal line
 3. head of patient and head of unit parallel
- C. Set timer for exposure
- D. Turn unit on
- E. Get film from dispenser
- F. Place film- 1/4" should show above occlusal plane
- G. Check Positions #2
 1. Be sure patient is motionless
- H. Take exposure
- I. Hang Button and cord on Unit
- J. Remove Unit Head form patient's face
- K. Remove film packet, write identification on Pack and Place in lead lined box.

FULL MOUTH X-RAY MOUNTED

X-RAYS



NOTE CURVATURE OF UPPER AND LOWER JAW

MAXILLARY CURVATURE TOWARD ROOTS
MANDIBULAR CURVATURE AWAY FROM ROOTS

Raised up - look in
depressed up - behind
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LANDMARKS FOR MOUNTING X-RAYS

Films should be mounted so teeth are in occlusion.

- A. Any group of X-rays of one person is mounted in sequence. Each area of one X-ray is the neighboring area of the film mounted next to it.
- B. Recessed dot on film is placed away from the face of the mount. Do not confuse clip marks with manufacturer's dot on film. Some film may not have a dot. In this case one side of the film will be shiny and the other a satin finish. Mount shiny side toward the operator.
- C. Upper landmarks
 1. Darkened area and/or spider-web-like lines of sinus usually visible above or between the roots of upper bicuspid and molar areas.
 2. The area behind the upper molars give a thicker sponge-like appearance than the lowers.
- D. Lower Landmarks
 1. Slight curve upward from cuspid area to molar area formed by (occlusal) biting surfaces
 2. Lower film has upward curve of bone at end of lower arch.
 3. Difference in size of upper anterior (wider teeth as compared to lower anterior teeth).

E. General**1. Root Differences: Roots always incline toward distal.**

- a. Upper Teeth:**
 - 1st Bicuspid has two roots
 - 2nd Bicuspid has one root
 - 1st Molar has three roots
 - 2nd Molar has three roots (may be fused)

- b. Lower Teeth:**
 - Both bicuspid have one root
 - 1st and 2nd Molars have two roots
 - 3rd Molar has two roots (may be fused)

CAUSES OF FAULTY FILMS

A. Very Light Films:

1. Underexposure
2. Insufficient developing
3. Use a cold developing solution
4. Use of old, contaminated or poorly mixed solution
5. Poor quality of films
6. Placement of film with LEAD-BACKED SURFACE toward teeth
7. Decreased voltage or milliamperage

B. Very Dark Films:

1. Overexposure
2. Underdevelopment
3. Use of too warm developing solution
4. Increased voltage or milliamperage
5. Accidental exposure to light
6. Unsafe illumination in darkroom

C. Blurred Films:

1. Running and swelling of the gelatin because of hot solutions or heat
2. Movement of patient
3. Movement of film
4. Movement of tube
5. An exposed film used by mistake for a second exposure

D. Distorted Films:

1. Excessive bending of film causes pencil lines
2. Improper direction of X-rays
3. Elongation, due to FLAT ANGULATION
4. Foreshortening, due to HIGH ANGULATION
5. Inclination of roots, especially of UPPER POSTERIOR TEETH, owing to X-rays being directed TOO MUCH posteriorly.

E. Streaked, Stained Films:

1. Insufficient fixing
2. Contaminated solutions
3. Inadequate or insufficient washing
4. Improper or careless handling of films
5. Film packet paper stuck to film, by moisture from excess saliva
6. Exposure to light on part of film
7. Excessive wet film packs - Retake immediately
8. Uneven developing - Not mixing solutions

F. Films with Partial Images:

1. Film in contact with hanger, side of developing tank or another film (preventing uniform action of developer).
2. X-rays not properly centered on film cause 'cone cuts'
3. Part of film not immersed in developing solution

G. Fogged Films:

1. Using old films
2. Stray radiation
3. Exposure to light and unsafe illumination in darkroom
4. Improper unit settings

H. Foreign Images on Films:

1. Radiopaque substances in path of X-rays, such as rubber or lead glass in cone of tube
2. Finger projected between tube and film
3. Rims of eyeglasses, rubber dam frames, partial clasps, etc.
4. Static discharges causing exposure of film and producing black, treelike images
5. Fishbone image - film placed back to front

6. Excessive bending of film, the packet is cracked in spots, admitting daylight and causing black spots on the film
7. Debris marks caused by dirty work area
8. Sprung packet - edges will be black
9. Air bubble spots - improper agitation
10. Water spots - splashing or hanging wet hanger against dry film

I. Finger Printed Films:

1. Improper handling of film with wet or sweaty fingers

J. Reticulated Films

1. When there is too great a difference between the temperature of the developer and wash water and of fixer and wash water, a SWELLING OF THE GELATIN occurs; this results in a PUCKERED or NET-LIKE appearance of the film.

K. Film:

1. Brown film - Not properly developed, fixed and washed
2. Underdeveloped film - Black paper liner left on film when developed

Information Sheet

Radiology

X-RAYS

Complete Mouth Series of Dental Radiographs - Sixteen.

UPPER MOLAR AREA

1. The teeth in focus 2nd and 3rd molars
2. Film lengthwise
3. The anterior border at the mesial border of the 1st molar
4. The lower border of the film should be 1/4 inch below the occlusal plane of the teeth
5. Horizontal target position is directly between the teeth
6. Vertical angulation 20 positive
7. Facial landmark - Directly below the outer corner of the eye and under the cheek (molar) bone

BICUSPID AREA

1. The teeth in focus upper bicuspids and 1st molar
2. Film lengthwise
3. The anterior border covers 1/2 of cuspid
4. The lower border of film should be 1/4 inch below the occlusal plane of the teeth
5. Horizontal target position is directly between the teeth
6. Vertical angulation 30 positive
7. Facial landmark - Directly below pupil of the eye

CUSPID AREA

1. The teeth in focus cuspid and lateral
2. Film widthwise
3. The anterior border covers central incisor
4. The lower border of film should be 1/4 inch below the incisal edge of the teeth
5. Horizontal target position is centered directly on the cuspid
6. Vertical angulation 45 positive
7. Facial landmark - Ala of the nose

CENTRAL INCISOR AREA

1. The teeth in focus central incisors
2. Film widthwise
3. The midline directly in the center of the film
4. The lower border of film should be 1/4 inch below the incisal edge
5. Vertical angulation 40 positive
6. Facial landmark - Center of tip of nose

BITE WING AREA

1. The teeth in focus all upper and lower crowns of all the posterior teeth
2. Film lengthwise with bite tab between the upper and lower teeth
3. Smooth side of the film toward teeth
4. The anterior border covers 1/2 of the cuspid
5. Horizontal target position is between the upper and lower teeth aimed at the mesial of the first molar
6. Vertical angulation 8° positive
7. Facial landmark - Place of occlusion at just forward of corner of eye

LOWER MOLAR AREA

1. The teeth in focus 2nd and 1st molars
2. Film lengthwise
3. The anterior border at the mesial border of the 1st molar
4. The upper border of the film should be 1/4 inch above the occlusal plane of the teeth
5. Horizontal target position is directly between the teeth
6. Vertical angulation 5° negative
7. Facial landmark - 1/4 inch above lower border of mandible directly at the second molar

BICUSPID AREA

1. The teeth in focus lower bicuspids and 1st molar
2. Film lengthwise
3. The anterior border covers 1/2 of cuspid
4. The upper border of film should be 1/4 inch above the occlusal plane of the teeth
5. Horizontal target position is directly between the teeth
6. Vertical angulation 10° negative
7. Facial landmark - 1/4 inch above lower border of mandible directly at the second bicuspid

CUSPID AREA

1. The teeth in focus cuspid and lateral
2. Film widthwise
3. The anterior border covers central incisor
4. The upper border of film should be 1/4 inch above the incisal edge of the teeth
5. Horizontal target position is centered directly on the cuspid
6. Vertical angulation 20° negative
7. Facial landmark - 1/4 inch above the lower border of the mandible directly at the cuspid

CENTRAL INCISOR AREA

1. The teeth in focus central incisors
2. Film widthwise
3. The midline directly in the center of the film
4. The upper border of film should be 1/4 inch above the incisal edge
5. Vertical angulation 15° negative
6. Facial landmark - 1/4 inch above the lower border of the mandible directly between the central incisors

Safety Factors:

1. patient holds the film
2. lead line apron for the patient
3. assistant wear a lead lined apron or stand behind a shield. (optional)
4. stand at least 3' away, during exposure
5. never touch head during exposure
6. stand behind the head of the X-ray machine. Never stand in direct path of the beam
7. wear a moniter badge
8. ask patient if he has had X-rays with in the past 3 weeks. Don't take if so.
9. don't excoeed saftey dosage - 320 r (roetgens)
10. use ultra-speed film - 1/4 sec.
11. use proper filters
12. use proper diaphragm
13. follow federal regulations in having your machine checked
14. no X-rays if the person is in the 1st three or last three month of pregnancy.

Information Sheet;
Removal of Film from Packet

Information Sheet
Page ___ of ___ Pages

HOW TO REMOVE INTRAORAL FILM FROM FILM PACKET
AND PLACE ON FILM HANGER

INTRODUCTION:

Care must be taken when opening dental film and extracting the film from the container in order to avoid injury of the emulsion through crimping, scratching, or finger marking. A definite routine must be established. Finger-nail markings appear as moon-shaped images when the film is developed. This damage is usually done at the time the film is softened prior to placing it in the mouth, or at the time the bite-wing tab strip is placed on the film.

MATERIALS:

Exposed film
Clip hanger
 single clip
 clip of four
 clip of fourteen
 clip of sixteen

PROCEDURE:

1. Hold the film packet in the right hand (if you are right handed.)
2. Tear off the back paper, taking care not to tear the film.
3. Very carefully remove the wrapping paper from the upper half of the film.
4. Peel down the lead foil backing and protective black paper on both sides of the film.
5. Clip the film to the hanger. CAUTION: Do not put fingers on the emulsion because the finger print will remain.
6. Press jaws of the film together to fasten the film securely.
7. Slip the wrapping off the film.
8. Repeat the above procedure, filling one side of the hanger first.

HOW TO HELP YOUR TEETH LAST A LIFETIME

By LAWRENCE GALTON

Author of *The Laboratory of the Body*, a review of current dental research

THE MOST EXCITING news in dentistry today is that effective home care to prevent plaque formation is a prime weapon against both tooth decay and gum disease. Dentists who are now introducing this new preventive dentistry into private practice report enthusiastically that decay may possibly be reduced by up to 90 percent, and even more, in both children and adults; that gum disease can also be stopped; and that the required measures are to a very great extent simply more effective methods of home care.

More and more dentists are now taking time to educate patients in proper home-care methods. Here, step-by-step, is a guide to the effective mouth care advocated by many dentists. You can check the guide with your own dentist for any special suggestions he may have that could make it more valuable to you.

Guide to Effective Mouth Care

This is a guide to thorough cleaning of the mouth, not just brushing of the teeth, as an effective means of helping to prevent both decay and gum disease (gingivitis, pyorrhea).

- Whenever possible, brush after eating to remove food particles.
- In addition, one complete daily cleaning of the mouth—preferably at bedtime when you can take time to be thorough—is essential. Decay takes place when *mouth bacteria* attack food particles and produce acid that eats away at the tooth structure. The bacteria cluster on teeth in a film called *plaque*. Plaque also fosters *tartar formation* and in turn gum inflammation and infection. Because it takes 24 hours for plaque to form anew, one complete cleaning

daily can help get rid of this prime factor in both gum disease and tooth decay.

Cleaning Aids

- **Toothbrush.** Preferably soft bristle (never hard) because it will be used at the gum line as well as on the teeth. A soft-bristle brush, gently used, will do no damage to gum tissue; a stiff-bristle brush may.
- **Dental Floss.**
- **Dentifrice.** Preferably fluoridated.
- **Irrigator, or Water Spray.**
- **Disclusing Wafers.**
- **Mirrors.** Either a small inexpensive plastic-handled hand mirror for seeing inside the mouth or a specially designed lighted viewing mirror.

Brushing

- Properly used, your toothbrush cleans *three* of the five tooth surfaces—chewing, cheek side and tongue side. *Note:* A critical and often-missed zone is the 1/16th of an inch at the gum margin. *Plaque and bacteria near the gum line must be removed.*



How to brush the teeth correctly:

1. Direct the brush bristles gently at the crevice *between* gum and teeth. Mildly vibrate brush handle so bristles do not travel or skip but can

dislodge material in this area.

2. Move brush back and forth in a gentle scrubbing motion, moving from tooth to tooth, applying gentle but firm pressure, so bristles travel over surface of tooth until plaque is gone, as determined by disclosing agent.



- *Brush upper teeth.*



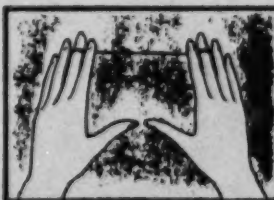
- *Brush lower teeth.*



3. Brush both surfaces next to the cheek.
4. Brush both surfaces next to the tongue.
5. Brush across the chewing surfaces.

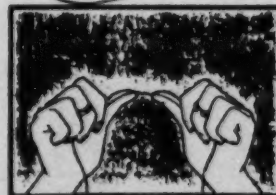
Flossing

Floss cleans away plaque from the tooth sides and from between the teeth—the two tooth surfaces that are *not* cleaned by brushing.



How to floss correctly:

1. Cut off a piece of dental floss 18–24 inches long. Wrap ends around forefinger and middle finger of each hand, leaving the thumbs free.
- To floss between upper teeth, hold thumbs about one inch apart, keeping floss taut between them, and use the



thumbs to guide the floss between the teeth.



- For lower teeth, use the forefingers to guide the floss, keeping them about one inch apart.



2. Slip the floss between a pair of teeth. Do not try to snap floss through a tight area. Instead, work it gently back and forth till it passes through.
 3. Draw the floss to the base of one tooth, stopping it just under the edge of the gum.
 4. Scrape the floss up and down against the side of the tooth till you get a rough or squeaky feeling that means you have broken through the plaque and are actually touching the tooth surface.
 5. Move floss to clean the side of the adjoining tooth in the same manner.
 6. Move to the next pair of teeth and the next, till all side-teeth surfaces are cleaned.
- Note:* If gums bleed, this indicates the area has not been



INFORMATION SHEET RUBBER DAM

The rubber dam is used in a procedure when maximum dryness is desired. It can be placed in 3-5 minutes, the time it takes for anesthesia to take.

ADVANTAGES:

1. provide clean, dry operating field.
2. provide protection for the patient and operation team.
3. provide conditions for improved properties of dental materials.
4. helps retract cheeks, lips, tongue and gingiva.
5. economic aid to the dental office.
6. conditions which promote dental service to highest quality.

As the chairside assistant, you would prepare the rubber dam for placement, assist in applying to the oral cavity and in the removal.

MATERIALS NEEDED: (set up on page 448 of textbook)

rubber dam use a 6x6 medium gauge .008 inches
holder
clamp, chosen for the appropriate area
punch
clamp forceps
napkin
lubricant
modeling compound
dental floss

RULE: isolate to the canine of the opposite arch from operating site. This set routine for you and the dentist with a minimum of 3 teeth isolated except in endodontic therapy 1 tooth is exposed.

1. holes $\frac{1}{4}$ " apart.
2. punch at least 1" from the border of the dam so enough is left to fit outside the mouth, on the frame (holder).
3. hole sizes should be smaller on thinner dams, because the rubber will stretch.

INFORMATION SHEET

SHEET #

MATRIX RETAINER & BAND

LESSON PLAN

Topic: PREPARATION OF MATRIX RETAINER AND BAND

Introduction

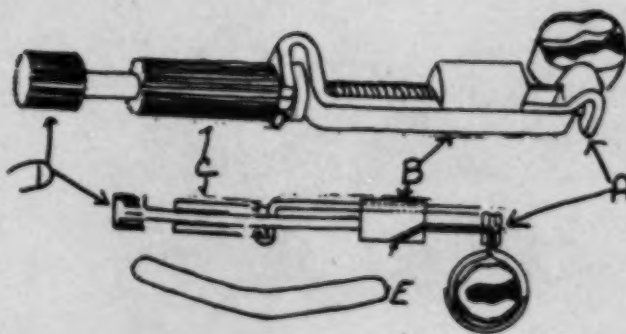
The chairside dental assistant should learn exactly how to prepare a matrix retainer and band in order to expedite restorative procedures.

List of Materials

Matrix band (Universal)
Toffelmire retainer

Procedure

1. Examine matrix retainer parts.
 - a. Slotted head (A)
 - b. Band locking seat (B)
 - c. Band stretching screw (C)
 - d. Band locking screw (D)
2. Examine matrix band (E)
 - a. Shaped as an "open U"
 - b. Bring ends together and one side of loop formed will be wider than other.
3. Assembling of matrix band with matrix retainer
 - a. Loosen band locking screw. (C)
 - b. Bring ends of matrix bands together. Wider edge will go toward occlusal surface of the tooth.
 - c. Hold matrix retainer in left hand with smooth (non-slotted) side up. This side will go toward the occlusal surface of the tooth.
 - d. Place folded matrix band through center slot of head (A) with ends extended through band locking slot (B) (approximately 1/16 inch) and loop extending beyond slotted head (A).
 - e. Tighten band with clockwise turn of band locking screw (C).
 - f. Matrix band and matrix retainer may be set up this way prior to operative procedure.
 - g. Once area of restoration is determined, retainer must be adjusted for proper positioning.
 - h. Loosen band locking screw (C) slightly.
 - i. Slip matrix band out of center slot and reposition one of the side slots according to quadrant indicated. To determine which slot to use remember the following rules.
 - (1) Smooth side of slotted head (A) goes toward occlusal surface of tooth.
 - (2) Widest edge of folded matrix band goes toward occlusal surface of tooth.
 - (3) Unless previously indicated, matrix retainer is placed on buccal surface of tooth being restored.
 - (4) Positioning of the band in the retainer is the same for the upper right and lower left quadrants, and is the same for the upper left and lower right quadrants.



Application

Dental assistants can prepare matrix band and matrix retainers in advance for the dentist to conserve time or, if permitted by State law, place on tooth to be restored.

* NOTES:

INFORMATION SHEET

SHEET #

ORAL EVACUATOR

SUCTION TIP PLACEMENT
AND MANIPULATION**Introduction:**

Efficient debriding of the oral cavity by the dental assistant is an important and valuable part of four-handed dentistry. Proper use of the suction tip provides the operator "see-ability" and better access to the operative site. This in turn, can result in better patient comfort and enhances the dentist's ability to maintain a high level of quality dental care.

Basic grasps

Pen grasp — with the right hand, hold the tip as a pen with fingers at the adjustable joint so the bevel can be easily controlled. The vacuum hose is supported under the arm (see Fig 1).

Reverse palm-thumb grasp, or "Thumb-to-nose" grasp — with the right palm, grasp the tip with the thumb directed away from the patient's mouth. The vacuum hose is supported under the arm (see Fig 2). Note, the left hand is free for tissue retraction manipulation of the air-water syringe and instrument transfer. The suction tip should be positioned first. The handpiece and mouth mirror are then positioned.

Suction tip placement

The tip should be positioned as closely as possible to the tooth being prepared without injuring the soft tissue or evacuating the water before it cools the tooth (see Fig 3).

The bevel of the tip should be parallel with the buccal, labial or lingual surface of the tooth being prepared (see Fig 4).

The edge of the tip should be even with the occlusal surface of the tooth being prepared (see Fig 5).

For anterior preparations (lingual approach) the tip is on the labial aspect with the incisal edge of the tooth bisecting the bevel of the tip keeping water spray from the mouth mirror (see Fig 6).

When tissue interferes with buccal tip placement, the tip may be positioned to the lingual of the upper left second and third molars. The assistant uses the "cross-chest" approach by grasping the tip in her left hand in a reverse palm-thumb grasp (see Fig 7). This approach should be avoided whenever possible as it requires the operator's right hand to be in a strained position.

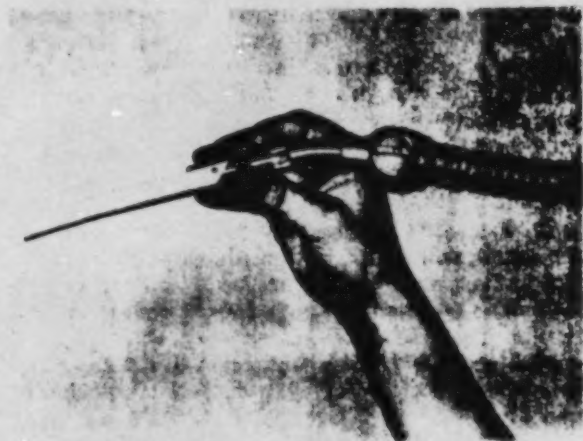


Fig 1

INFORMATION SHEET
ORAL EVACUATOR

SHEET #



Fig 2



Fig 3

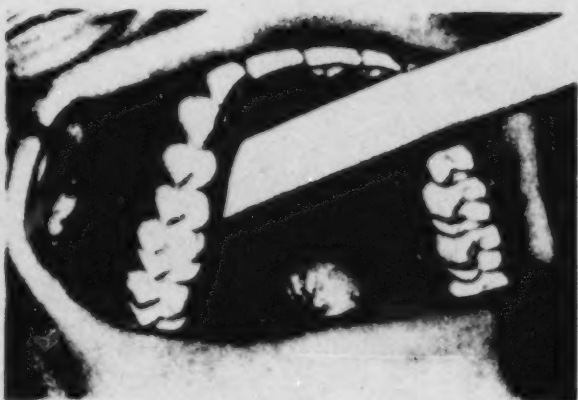


Fig 4



Fig 5



Fig 6



Fig 7

Use of the articulator

Samuel J. Veal, DMD
William J. Simon, DDS

AN ARTICULATOR is a mechanical device simulating the mandible, maxilla and temporomandibular joints. Articulators are very interesting machines. There are literally hundreds of types of articulators on the market. For convenience, they can be broken down into three categories:

1. The non-anatomical, non-adjustable articulator — simple hinge
2. The semi-anatomical, semi-adjustable articulator
3. The anatomical, adjustable articulator

Note the word anatomical appears in all three categories. This is rather ironic, for none of these devices is truly anatomical. Even the so-called anatomical articulator cannot reproduce morphology of the temporomandibular joint. Yes, it is possible to make a tracing and three-dimensional reproduction of the glenoid fossa and the articular eminence, but the plaguing question is what is the relationship of the condylar heads to the articular discs to the glenoid fossae when the mandible is functioning? Fortunately, all of the articulators come close in the reproduction of mandibular movements and when corrections must be made, they can be made in the patient's mouth.

Thus, one subclinical duty is to mount casts in an articulator. We shall illustrate three articulators representative of the three categories mentioned before because in all probability your dentist will have all three types in the preparation area.

The Stephan articulator (Model A) is an example of a non-anatomical, non-adjustable device. Yet this description is not literally true, for the Stephan articulator does open and close and through a spring arrangement it is possible to simulate right and left movements. The point is that these movements are an ap-

proximation of the actual movements in a practical case.

There are many uses for the Stephan articulator and it seems to be an articulator of choice for many commercial dental laboratories. The technique of mounting a pair of casts in a Stephan articulator is not difficult. However, it is a relatively small articulator and the first step is to grind the casts so that they will slip in between the bows of the articulator (Fig 1).

Note how closely the articulator simulates the osteology of the face. The lower bow of the articulator represents the mandible which sends up vertical support arms representing the rami. The hinge arrangement represents the temporomandibular joints and the upper bow the maxilla.

The Stephan articulator has a locking nut which presets the space between the upper and lower bows. In most instances these bows should be preset as parallel and the locking nut tightened in this position. Note in Fig 2 that the bows are parallel and that the casts have been trimmed so that they will slip into place between the bows. Likewise, the wax bite registration is in place while doing this adaptation.

When the casts have been adapted to the articulator, they are fastened to the bows of the articulator with plaster (Fig 3).

When the plaster is set the articulator may be opened and the wax bite removed. Now the importance of the wax bite can be seen. This is a routine procedure regardless of what type of articulator is used.

Many dentists use a semi-anatomical, semi-adjustable articulator called the Hanau. When this articulator is used with a face bow for bite registration, the casts are mounted between the upper and lower bows in relatively the same planes as they are in the patient's mouth. The face bow is in reality a device for taking the bite registration. It consists of a bite fork over which wax or another medium is placed prior to having the patient make the registration. The fork is attached to a bow which goes from the opening of the right ear to the left ear. The face bow with the bite registration and upper cast is plastered to the upper bow. The face bow

Dr. Veal is Coordinator of the Dental Section of the Division of Health Services and Dr. Simon is Professor of Restorative Functions for Dental Assistants at the University of Louisville, School of Dentistry, Louisville, Kentucky.

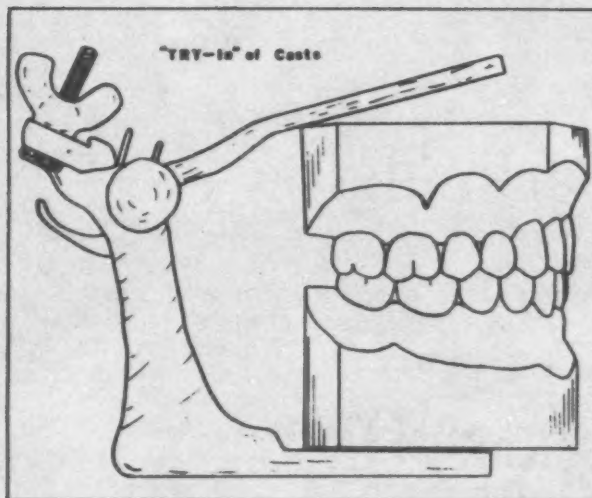


Fig 1 Try fit of casts to articulator

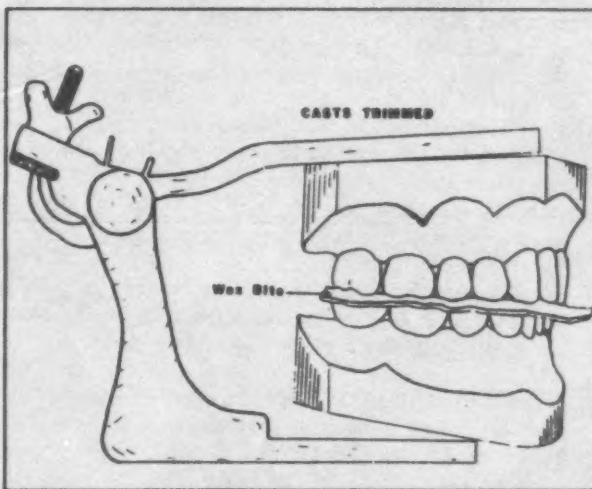


Fig 2 Bows parallel and casts trimmed

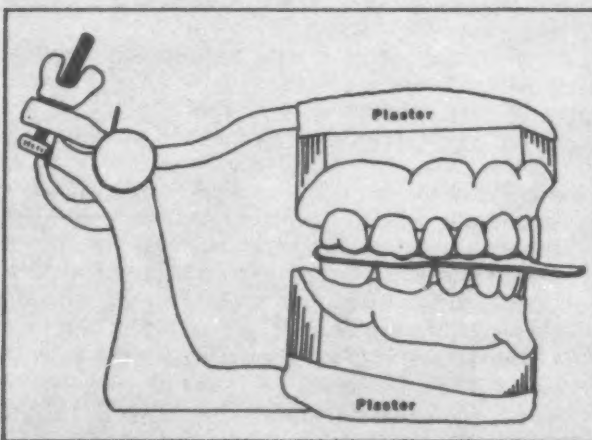


Fig 3 Plaster the bows to the casts

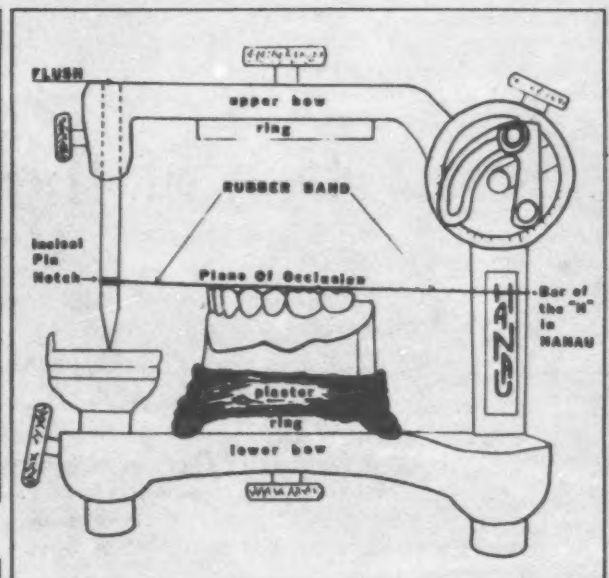


Fig 4 Mounting lower cast in a Hanau

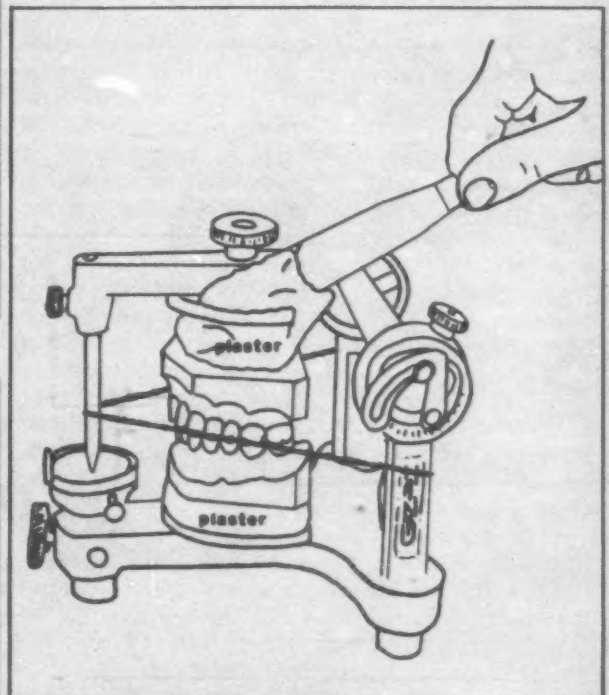


Fig 5 Mounting the upper cast in the Hanau articulator

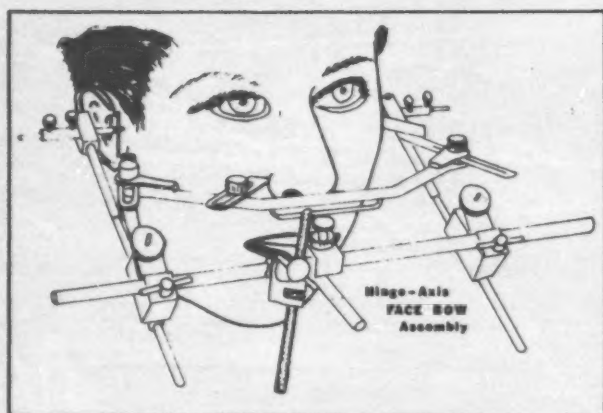


Fig 6 Face bow for hinge axis

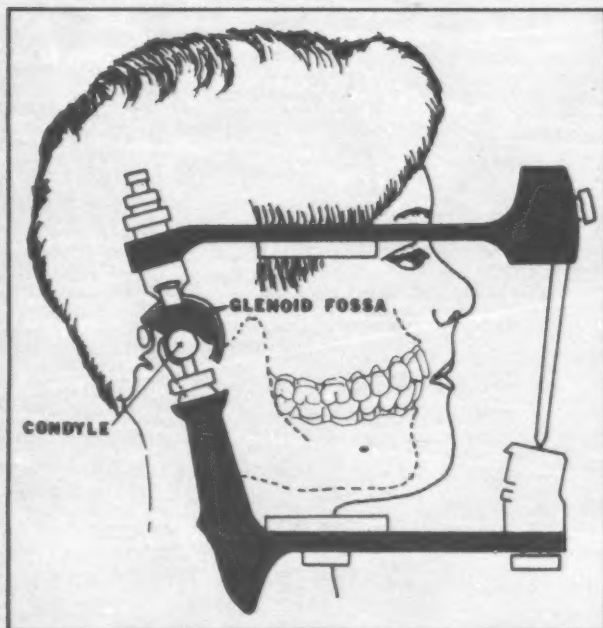


Fig 7 The goal of the anatomical articulator

positions the cast in the proper anterior posterior relationship as well as the inferior superior relationship.

Not all dentists use a face bow with the Hanau articulator. In fact, there is an easier way to mount casts in a Hanau articulator and get approximate results. The clinical dental assistant will be expected to mount casts in the Hanau articulator as this is one of her subclinical duties.

The first step in the technique is to make certain that the articulator is functioning properly; that is, all adjustments are free, plaster from previous use has been removed and the bows are parallel. This paralleling of the bows in the Hanau is controlled by the incisal guide pin. This pin must be set flush with the upper bow (Fig 4).

A rubber band is placed over the entire articulator. It should rest at three points — the notch in the incisal pin and two on the "bar" in the H on Hanau as imprinted on the vertical posts of the articulator. When the rubber band is in place, it will establish the plane of occlusion for the lower cast. The next step is to place plaster over the ring on the lower bow of the articulator and *force* the lower cast down into the plaster until the plane of the occlusion of the cast coincides with the plane of occlusion established by the rubber band.

When the plaster around the lower cast is set, the upper cast is positioned. This may be positioned with a wax bite registration. The remaining step is to plaster the upper cast to the ring of the upper bow of the articulator (Fig 5).

In mounting casts to any articulator, always remove excesses of plaster and make the mountings as neat as possible. Similarly, when removing casts from an articulator, always clean the parts thoroughly. It is a good plan to coat the articulator with a thin film of vaseline before putting it away for storage.

The mounting of casts in the Stephan articulator and the Hanau articulator is a solo procedure which the clinical dental assistant should perform. However, when we consider the bite registration and the articulator mounting in an anatomical, adjustable articulator, we have a truly dual situation.

The bite registration for mounting casts in an anatomical articulator involves the use of a pantagraph face bow. This face bow is a complicated device with many adjustments (Fig 6).

In fact, usually the dentist and clinical dental assistant work from both sides of the patient and one sets or adjusts as the other secures the adjustment. This is done for the purpose of accurately determining the hinge axis to the patient. Hinge axis is a new term but it is not difficult to understand. If you think of an ordinary hinge on a door you know there is a pin which holds the two halves of the hinge together. The pin becomes the axis or axle about which the door rotates. The mandible, too, functions like a door on a hinge. That is, it swings up and down. An imaginary line drawn through the temporomandibular joints represents the axis about which the mandible swings; hence, the expression "hinge axis."

When all of the readings and the adjustments have been made on the face bow, it is transferred to the anatomical articulator and the same readings and settings are made on the articulator. With reasonable accuracy, the casts mounted in an anatomical articulator reproduce the normal movements of the mandible with respect to the maxilla (Fig 7).

For extensive reconstruction of the occlusal surfaces of a natural dentition, the anatomical articulator is the most desired instrument. However, because the measurements are to such close tolerances, extreme precaution must be exerted to prevent errors.

DIRECTIONS FOR MAKING ORTHODONTIA AND STUDY MODELS
with
COLUMBIA RUBBER MODEL-BASE FORMERS

1. **DO NOT BOX IN THE IMPRESSIONS** or **BUILD UP A SURROUNDING WALL FOR A BASE**, except a wall-stop at the heels to prevent the poured stone from flowing out.
2. Make a mix of quick-setting stone, and vibrate it into the impressions.
3. When the stone is set, separate the casts from the impressions and trim away from the margins, with a coarse file, any overhang or irregularities.
4. Select a set of Rubber Model-Base Formers nearest in size to the casts.
5. Setting the Upper Cast in the Rubber Model-Base Former:
 - (a) To keep the buccal and labial surfaces free from the added stone, cover these surfaces with a strip of adhesive tape.
 - (b) Mix a sufficient amount of quick-setting stone to a thick, creamy consistency.
 - (c) Fill the upper Rubber Model-Base Former first with the soft stone and set the upper cast in it, centering and pressing it down to obtain desired height and proper occlusal plane. (Attention is directed to circumferential line near bottom surface of each Former, which indicates inside plaster line, so that the thickness of rubber is taken into consideration when judging the height of finished casts.)
 - (d) After the stone has set to a state permitting handling without disturbing the cast, strip off the adhesive tape, remove all the excess stone carefully, and smooth the new surfaces with a moist piece of cloth or with the fingers, under a small trickle of water.
6. Setting the Lower Cast in the Rubber Model-Base Former:
 - (a) Occlude the lower cast with the upper model still in the Rubber Model-Base Former, and secure this position of the lower cast with suitable sticky wax, adhesive tape, a rubber band, or other such media.
 - (b) Make a mix of quick-setting stone to the same consistency previously described, and fill the lower Rubber Model-Base Former.
 - (c) Immediately following, bring together both the upper and the lower Rubber Model-Base Formers against the upright back of your work bench. To obtain the desired height, press down on a center line into the soft stone in the lower Rubber Model-Base Former, the upper cast with its attached lower cast.
 - (d) When the stone is hardened in the lower Model-Base Former, separate the two casts. Strip off the adhesive tape from the buccal and labial surfaces, trim away excess stone, and smooth the surfaces as previously described in 5 (d).
7. After the casts are removed from the Rubber Model-Base Formers, the muco-buccal anatomy is suitably carved with a penknife or carving instrument, and the surfaces finished and made smooth with fine sandpaper.
8. **FOR A LUSTROUS, WASHABLE FINISH ON STONE OR PLASTER MODELS, USE COL JMBIA MODEL GLOSS.**

COLUMBIA DENTOFORM CORPORATION

"The House of A Thousand Models"

A Syntex Company

49 East 21st Street 235

New York, N. Y. 10010

APPENDIX B

**Selected Handout Materials Utilized in the Methods of Instruction
for Health Occupations Teachers Workshop**

A GLOSSARY OF EVALUATION TERMS

1. Accountability: Being responsible for making actions open to view; keeping records and disclosing the activities and results of a program.
2. Audiences: Any person (e.g., administrator) or group (e.g., community board) that might use the information produced by an evaluation. Primary audiences are those who request an evaluation or whose questions will be addressed by the evaluation; secondary audiences are others also affected by evaluation results.
3. Continuous program evaluation: Ongoing and systematic evaluation (usually carried out by program personnel) of various aspects of programs that might contribute to program improvement.
4. Criteria: Qualities or dimensions for which a program, product or activity are to be judged.
5. Discrepancy evaluation: Any evaluation approach emphasizing the discrepancy between performance of an individual, program, or product and prespecified criteria of adequacy, (e.g., program goals, objectives, ideal states).
6. Formative evaluation: Evaluation conducted during program or project operation so that immediate feedback may be provided and appropriate changes made; especially important in developmental phases of program or project operation.
7. Goal-free evaluation: An evaluation approach in which the evaluation deliberately remains ignorant of a program's intentions so that he may focus more on empirically determined outcomes.
8. Issues: The central concerns of an evaluation; those questions to be addressed by the evaluation (e.g., accomplishment of goals, adequacy of instruction).
9. Reporting: Any presentation of evaluation findings to various audiences.
10. Side effects: Any consequences, intended or unintended, other than those directly evoked.
11. Summative Evaluation: Evaluation conducted usually after an educational process has been completed so that judgments and comparisons might be made of its effectiveness.

ON THE USES OF ACCOUNTABILITY

Dennis Gooler

1. Accountability may reduce waste.
2. Accountability may force us to examine goals; it may also force us to pursue goals most easily attained.
3. Accountability may take the best from us. We may need to become more mechanistic, more specific - goal oriented.
4. Accountability may, for the first time, let us really see what we are actually doing.
5. Accountability may force us to use our dollars in ways we do not deem desirable.
6. Accountability may enable us to show what we do with our dollars.
7. Accountability may deceive us by making us think we are doing what we are not.
8. Accountability may force us to refine our techniques for measuring and judging what we do.
9. Accountability may force us to depend only on those things we can now measure.
10. Accountability may work for us.

We may work for accountability.

CONSIDERATIONS IN CHECKING THE QUALITY OF EVALUATIVE DATA

Stephen Kemmis

1. Consideration of Relevance, Balance and Scope of the Data

Are data relevant to issues?

Are data matched to audience information requirements or preferences?

Is sufficient descriptive information available about the program?

Is there adequate coverage and treatment of program performance, products, procedures, needs, goals or outcomes?

Is the description balanced?

Are outcomes real? Are effects actually observed not merely claimed?

Are the outcomes due to the program?

Are data available on goals achieved and not achieved? Short-term and long-term consequences? Intended - effects and side effects?

2. Considerations of Validity, Reliability and Redundancy

Are observations valid (measure what they are supposed to measure) and reliable (measure consistently and accurately)?

What are the sources of error in the measures or observations?

Was the program observed under typical conditions -- setting, funding, motivation, participants, personnel?

Were observations confirmed or denied?

Were multiple criteria of program performance used? Were experts' views sought? Were participant or personnel reactions collected? Were observations cross-checked, verified? Were adversaries or critics' views gathered?

3. Considerations of the Believability of the Evaluator, Judges, Observers and Informants

A. General Criteria for judging the believability of people.

1. Is the statement in the person's area of experience?

2. Did the person study the matter?

3. Was the person disinterested?

4. Does the person have a reputation for being honest and correct about the sort of thing considered?

5. Was the evaluator distracted by research, political aspects or other interests?
6. Did the evaluator establish and maintain credibility in general with respect to participants, personnel, clients and audiences?

FORMAT FOR AN EVALUATION REPORT OF AN EDUCATIONAL PROGRAM

Robert E. Stake

- Section I. Objectives of the Evaluation
- A. Audiences to be served by the evaluation
 - B. Decisions about the program
- Section II. Specifications of the Program
- A. Educational Philosophy behind the Program
 - B. Subject matter
 - C. Learning Objectives, Staff Aims
 - D. Instructional Procedures, Tactics, Media
 - E. Students
 - F. Instructional and Community Setting
 - G. Standards for Judging Quality
- Section III. Program Outcomes
- A. Opportunities, Experiences Provided
 - B. Student gains and losses
 - C. Side effects and bonuses
 - D. Costs
- Section IV. Relationships and Indicators
- A. Congruence
 - B. Contingencies
 - C. Trend Lines, Indicators, Ratios

Section V. Judgments of Worth

- A. Value of Outcomes
- B. Relevance of Objectives to Needs
- C. Usefulness of Evaluation
Information Gathered.

Materials adapted from Arden Grotelueschen, Evaluation Resource Notebook, Urbana, Illinois: Office for the Study of Continuing Professional Education, 1974.

EVALUATION DESIGN WORKSHEET

PURPOSE: Why evaluate?

AUDIENCES: Who is the evaluation for?

ISSUES: What questions should the evaluation address?

RESOURCES: What resources are available for the evaluation?

EVIDENCE: What evidence should be collected?

DATA-GATHERING: How is the evidence to be collected?

ANALYSIS: How can the evidence be analyzed?

REPORTING: How can evaluation findings be reported?

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CHARACTERISTICS OF THE ADULT LEARNER

1. Adults Must Have the Desire to Learn

Children will learn in response to external demands. Adults, often, will not. Adults learn most effectively when they have a strong inner motivation to develop a new skill or to acquire a particular type of knowledge. Their desire to learn may be awakened or stimulated by outside influence, but it can never be forced upon them.

2. Adults will Learn Only What They Feel a Need to Learn

Children can be induced to learn many things for which they can see no immediate use. But adults are much more practical in their approach to learning. They want to know, "How is this going to help me right now?" Many times they can be persuaded, through wise counseling, to learn things that will help them in the foreseeable future. But most often they learn best when they can get immediate results.

3. Adults Learn by Being Involved in the Learning Process

Research has shown that retention of new knowledge or skills is much higher if the adult has immediate and repeated opportunities to practice or use what he has learned. This finding explains why "on-the-job" training is often very effective in adult learning situations.

4. Adult Learning Focuses Upon Realistic Problem Solving

You can teach adults best by using specific problems, drawn from worldly experiences, and by developing practical solutions from which basic principles may be deduced. The importance of realism in adult education cannot be overstressed. Adults simply will not put their minds to work on a problem that has been contrived for school purposes.

5. Experience Affects Adults Learning

The most conspicuous difference between adults and children, as learners, is the adult's vast experience with life. This background of experience, this fund of knowledge acquired in the experience of living can be a great asset; but, it also can be a liability.

If new knowledge does not fit into the framework of what he already knows, or thinks he knows, he can very easily reject it. His past experiences may actually prevent him from perceiving and absorbing new knowledge and data.

6. Adults Learn Best in an Informal, Varied Environment

Adult learning is facilitated in an atmosphere which encourages people to be active; that promotes individual discovery and meaning of ideas; which recognize an adult's right to make a mistake; which encourages openness of self rather than concealment; which permits confrontation as well as cooperation; and which provides opportunities for self-evaluation.

Characteristics of the Adult Learner

7. A Variety of Methods Should Be Used in Teaching Adults

There are numerous teaching methods that can be used in imparting knowledge. In adult education the teacher should attempt to use a variety of teaching methods, provided they adequately fulfill the intended learning objectives.

8. Adults Need Guidance--Not Grades

Research has shown that academic competition has a negative effect upon most adult learners. Most adults are apprehensive about their learning capacities, and they have been told repeatedly (and falsely) that "you can't teach an old dog new tricks." When faced with tests, grades, and other comparative evaluation forms, they will withdraw from the learning experience.

9. Adults May Have Physical Handicaps That Prevent Learning

Hearing and sight impairments are the most common causes for poor learning in adult education programs. The lack of muscular coordination and the presence of poor health are also important considerations to adult learning defects.

THE ADULT LEARNER

Learning Ability

Thorndike's study compared learning a variety of skills by three age groups 20-24 years, 25-35 years and 35 years and over. Every individual did learn the required task, yet the amount of performance was greatest in the younger group, slightly less in the middle group and much less in the older group. For older people, at least, learning ability is not identical with learning rate. Thorndike's curve of "learning" in relation to age primarily describes learning efficiency which was at its peak at 25 years of age and declined a little less than one per cent per year to 50 years. Later investigations by Miles, by Jones, and by others extended this approximate decline to 70 years of age.

Speed of Reaction

That individuals slow down as they grow older is a fact established by much evidence. Beginning as early as 1884 with the data collected by Galton, reaction speed was found to increase from early childhood to the 20's and 30's and to have a fairly significant decline beyond the 40's. The decline in reaction speed after the age of 30 years was confirmed by the researchers of Miles, of Bellis and of others. Thorndike found that all his subjects did learn a variety of tasks, but that there was a difference between younger and older learners in speed of performance. In addition to, perhaps because of, this physiological decrement several researchers suggest that sometime after the 40's most individuals, either consciously or unconsciously, adapt a slower tempo in doing work, maintaining a pose that gives more uniform performance with lessened stress and strain. Because of the measured decline in speed of reaction, curves portraying learning performance must underestimate the learning potential of those in the wide age range beyond the 30's.

Hearing and Seeing

Galton's data showed a decline in auditory acuity from a peak between 10 and 14 years. Speed of hearing also has a decrement with age so that the older the adult the longer the time required to hear a full message. Further, the older person's inability to hear may lend many in the latter half of life to develop personality quirks in their self-concepts inimical to their own well-being.

Data collected in the 1935-36 National Health Survey showed different patterns in the decline in hearing of men and women. Women lost auditory acuity for low tones, men lose auditory acuity for high tones. As a result men will tend to understand the speech of women less well, and vice versa.

Collins and Britten have shown that from the maximum visual acuity in the late teens or early 20's there is a slow but steady decline to the middle 40's when the presbyopic (bifocal vision) decline brings a sharp and continuing reduction in relative visual acuity. Some studies show an accompanying slowing in the speed of seeing. Especially do shifts from

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far to near or vice versa take increasing time as age increases. In the classroom looking from blackboard to notes and books takes time. Ferree and Rand have demonstrated that increased intensity of illumination greatly improves vision though glare must be kept at a minimum.

Intelligence Does Not Decline

Bright people of 20 do not become dull by 60, nor do dull young people become Moronic by 60. An individual at 60 can learn the same kinds of knowledge, skill, and appreciation at 60 that he could at 20 years of age.

Age as age probably does little to affect an individual's power to learn or to think. His performance may be reduced because of changes in his speed, sensory acuity or self-concept, or shifts in values, motivation, goals and responsibilities which come with aging. Adults learn much less than they might partly because of the self-underestimations of their power and wisdom, and partly because of their own anxieties that their learning behavior will bring unfavorable criticism. Failure to keep on learning may affect performance more than power itself.

CONDITIONS FOR LEARNING

Rewards and Satisfaction

Learnings develop primarily as a consequence of satisfaction and reward. Punishment as an aid to learning is notoriously ineffective, with adults it is ruinous. In every learning situation punishment must be shunned. Since adults are prone to succumb to failure, error must be minimized in order to maximize genuine success. Each adult learner has his particular source of difficulty. Many of the difficulties come from notions that the learners have about themselves. Some will feel that they just cannot learn some things; one may block on languages, another fears numerical relations, and others freeze at performing in music or with paint. These attitudes undoubtedly flow from baleful learning experiences, but they may prevent individuals from ever giving themselves the opportunity to change. Such attitudes can be changed, however, by changing the learner's concept of himself, of the task, and of the role of the teacher.

Adult Experience

The accumulated experience of adults is of three kinds. First, the negative attitudes and self-concepts already considered. One of the most familiar and important is the negative attitude toward school. Many adults remember school as an unpleasant place where onerous tasks were assigned, where teachers forced one to study what he dislikes, and where students were ridiculed for mistakes.

Second are the cultural influences of a person's up-bringing. The part of the world, even the section of the country where a person spent his childhood and youth has left marks on his experience, his values and his ambitions.

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Third, an adult brings to learning situations a tremendous range of stored learnings--the residual acquisitions of school achievement in childhood and adolescence, the accumulations from experiences in every day living, information which has accrued from listening, looking and reading. These are most useful resources for learning.

Planning for Adult Learning

The premise of all planning for adult education is that there are tremendous individual differences. Within groups of adults there are greater differences than in groups of children or youths and greater differences than between any age groups. Adult education programs are in some measure self-selective. For example, the kind of people who voluntarily participate in formal education are quite different from those who are more or less coerced by social pressure into various community activities, or those who jobs depend on their participation in educational programs in industry. In spite of this selection, however, within each adult education group there will be wide individual differences which must always be taken into account.

Each situation should be planned so that the learners get a sense of mastery and success. Mastery may come from showing the individual that he can learn, or by pointing out the aspects of the task he can do already. Teachers must be prepared to adjust to the fact that older individuals, on the average, will tend to be slower. They will compensate for lessened hearing by speaking loudly, clearly, and deliberately, and for lessened vision by bright lighting, staying in clear sight of all group members, and using the blackboard with clear large writing. Lessons as well as assignments should be long enough to challenge but not so long as to frustrate. Tangential material is often more irritating and confusing than helpful.

The process of creating situations within which adults will have a rewarding learning experience is the basis for the adjustment of self-concepts and changing of attitudes from the negative to the positive. These negative feelings and notions built up over the years, however, will not be changed in a day. Continuing success and satisfaction in learning will be necessary to overcome them. These rewards and time can change attitudes, restore confidence, and develop new concepts of learning.

The resources which every adult brings to any learning situation is a great asset in teaching adults. Not only do adult learners already have the vocabulary and the concepts for much of his needed learning, but they also have their own concepts, attitudes, experiences, and knowledge which can enlighten and enrich the things to be learned. In every learning situation the resources of the group are tremendous, for each member can bring richness from his own life to illustrate what is being considered in the class. Teachers can count on much positive transfer from what is already familiar to the learners to the newer things to be acquired. One of the most important factors in the successful learning of adults is the teacher who capitalizes on the possibilities of transfer from the stored knowledge and skills of the adults they are teaching.

Irving Lorge, et al. Adult Education Theory and Method; Psychology of Adults, (Chicago: Illinois: Adult Education Association of U.S.A., 1963).

DEVELOPMENTAL TASKS FROM INFANCY THROUGH LATER LIFE

Infancy and Early Childhood (birth to six years)

Learning to walk.
 Learning to take solid foods.
 Learning to talk.
 Learning to control the elimination of body wastes.
 Learning sex differences and sexual modesty.
 Achieving physiological stability.
 Forming simple concepts of social and physical reality.
 Learning to relate oneself emotionally to parents, siblings, and other people.
 Learning to distinguish right and wrong and developing a conscience.

Middle Childhood (6-12 years)

Learning physical skills necessary for ordinary games.
 Building wholesome attitudes toward oneself as a growing organism.
 Learning to get along with age-mates.
 Learning an appropriate masculine or feminine social role.
 Developing fundamental skills in reading, writing, and calculating.
 Developing concepts necessary for everyday living.
 Developing conscience, morality, and a scale of values.
 Achieving personal independence.
 Developing attitudes toward social groups and institutions.

Preadolescence and Adolescence (12-18 years)

Achieving new and more mature relations with age-mates of both sexes.
 Achieving a masculine or feminine social role.
 Accepting one's physique and using the body effectively.
 Achieving emotional independence of parents and other adults.
 Achieving assurance of economic independence.
 Selecting and preparing for an occupation.
 Preparing for marriage and family life.
 Developing intellectual skills and concepts necessary for civic competence.
 Desiring and achieving socially responsible behavior.
 Acquiring a set of values and an ethical system as a guide to behavior.

Early Adulthood (18-35 years)

Selecting a mate.
 Learning to live with a marriage partner.
 Starting a family
 Rearing children.
 Managing a home.
 Getting started in an occupation.
 Taking on civic responsibility.
 Finding a congenial social group.

Developmental Tasks From Infancy Through Later Life

Middle Age (35-60 years)

Achieving adult, civic, and social responsibility.
Establishing and maintaining an economic standard of living.
Assisting teenage children to become responsible and happy adults.
Developing adult leisure-time activities.
Relating oneself to one's spouse as a person.
Learning to accept and adjust to the physiological changes of middle age.
Adjusting to aging parents.

Later Life (60-)

Adjusting to decreasing physical strength.
Adjustment to retirement and reduced income.
Adjusting to death of spouse.
Establishing an explicit affiliation with one's age group.
Meeting social and civic obligations.
Establishing satisfactory living arrangements.

The task concept and its meaning to education is presented by Havighurst in
HUMAN DEVELOPMENT AND EDUCATION, New York, Longmans, Green & Co., Inc., 1953.

Stages of Development	Intellectual Dimension	Emotional Dimension	Communication Model	Interaction of Intellectual and Emotional Dimension	Representative Behavior
Infant	1.What is this 2.Little cognitive understanding.	1.Safety, security, self-concept preservation. 2.Response to own viscera 3.Response to emotions from others.	1.Receiving communication. 2.Output is only social noise.	1.Conflicting	1.Dependency.
Child	1.Make sense of environment, order it, develop some beginning understanding.	1.Extension of safety and security needs.	1.Some response to communication from others. 2.Minimum of listening.	1.Partially supporting	1.Attempts to organize. 2.Exploring. 3.Function as individuals.
Adolescent	1.What can I get out of this?	1.Need for acceptance & belonging. 2.Expression of peaks & valleys of emotion.	1.Understands communication but often disagrees.	1.Conflicting	1.Rejection of authority. 2.Dependency & counter-dependency. 3.Blaming.
Young Adult	1.What can I learn from this? 2.It is possible to learn from peers. 3.Understand goals & objectives of training.	1.Awareness of feelings and emotions of others. 2.Acceptance of inadequacies. 3.Recognition for what I really am.	1.Sharing	1.Basically congruent.	1.Sharing information 2.Leveling. 3.Openness.
Adult	1.Desire to find out more about self & others. 2.Discuss emotions from intellectual viewpoint. 3.What can I give to this?	1.High value on authenticity 2.Acceptance of others, concern for feelings, desires for warmth, closeness. 3.Desire for growth	1.Sharing as equals. 253	1.Congruent.	1.Self-direction. 2.Wider participation. 3.Useful structure. 4.Leadership 5.Both negative and positive expressions are acceptable

WHAT IS LEARNING?

Clayton¹ says, "to learn is to engage in an experience that affects the psychological functioning of the individual in ways that will result in changes in his behavior." This statement refers to learning as both a process--"to engage in an experience" and as a product--"changes in his behavior." Dewey² points out that learning is a dynamic experience which continues as long as there is social and mental growth. Adults, young and old, are capable of continuous social and mental growth. Hence, adult educators provide settings which facilitate behavioral change.

Facilitating learning requires knowledge and comprehension of how students learn and the factors which influence behavior changes. Hilgard³ lists some useful generalizations about learning. These statements which a majority of learning theorists would agree are as follows:

1. A motivated learner acquires what he learns more readily than one who is not motivated. The relevant motives include both general and specific ones, for example, desire to learn, need for achievement (general), desire for a certain reward or to avoid a threatened punishment (specific).
2. Motivation that is too intense (especially pain, fear, anxiety) may be accompanied by distracting emotional states, so that excessive motivation may be less effective than moderate motivation for learning some kinds of tasks, especially those involving difficult discriminations.
3. Learning under the control of reward is usually preferable to learning under the control of punishment. Correspondingly, learning motivated by success is preferable to learning motivated by failure. Even though the theoretical issue is still unresolved, the practical outcome must take into account the social by-products, which tend to be more favorable under reward than under punishment.
4. Learning under intrinsic motivation is preferable to learning under extrinsic motivation.
5. Tolerance for failure is best taught through providing a backlog of success that compensates for experienced failure.
6. Individuals need practice in setting realistic goals for themselves, goals neither so low as to elicit little effort nor so high as to foreordain to failure. Realistic goal-setting leads to more satisfactory improvement than unrealistic goal-setting.
7. The personal history of the individual, for example, his reaction to authority, may hamper or enhance his ability to learn from a given teacher.
8. Active participation by a learner is preferable to passive reception when learning, for example, from a lecture or a motion picture.

What is Learning?

9. Meaningful materials and meaningful tasks are learned more readily than nonsense materials and more readily than tasks not understood by the learner.
10. There is no substitute for repetitive practice in the overlearning of skills (for instance, the performance of a concert pianist), or in the memorization of unrelated facts that have to be automatized.
11. Information about the nature of a good performance, knowledge of his own mistakes, and knowledge of successful results, aid learning.
12. Transfer to new tasks will be better if, in learning, the learner can discover relationships for himself, and if he has experience during learning of applying the principles within a variety of tasks.
13. Spaced or distributed recalls are advantageous in fixing material that is to be long retained.

THE LEARNING PROCESS

The foregoing generalizations suggest a blueprint or a model of learning. Steps in the learning process appear to be cyclical. First, the learner consciously recognizes a problem or individual need; second, learning experiences are selected; and third, practiced; fourth, learner obtains evidence of results; fifth, results are generalized and integrated; and sixth, assessment of results and finding new dissatisfactions and problems.

The role of the adult educator, as pointed out earlier, is to facilitate learning, and, therefore, the educator helps the learner recognize his present needs and probable future needs; helps him select appropriate learning experiences; and helps him evaluate his progress.

THE TEACHING-LEARNING TRANSACTION

Facilitating learning, in large part, requires an insight into learner needs. Adult education activities are generally group oriented, which means that different capabilities and interests are present. Individual differences materially affect learning outcomes in a group situation. Educators who are insensitive to these differences run the risk of "not reaching the student." Thus the teaching-learning transaction stresses attention to individual needs through group interaction.

There is no scientific evidence that any one teaching method is superior to another. Wallen and Travers⁴ claim "that different teaching methods emphasize different principles and neglect others." Since this is the case, there is little likelihood that any one method is superior to any other when the overall effects of teaching are appraised. Nevertheless, there is general agreement that participative learning is more likely to

What is Learning?

effect cognitive and affective changes than didactic methods. McKeachie⁵ observes "a common desire (by educators) to break away from the traditional instructor-dominated classroom and to encourage greater student participation and responsibility." Toward more student responsibility, the student-centered teaching method has emerged.

McKeachie⁶ describes twelve dimensions of student-centered teaching. Briefly, this method emphasizes the role of students in setting educational goals, in determining learning experiences, and in sharing responsibility for evaluating achievement.

In the opinion of the writer, the ideal adult educator is student-centered. He involves his students, by actively participating, in planning, implementing and evaluating educational activities. He recognizes individual differences and is responsive to felt needs of his students. Finally, he sees learning as both a process and a product. The process is problem oriented and the product is a conscious social and/or mental change in the learner.

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THE PSYCHOLOGY OF LEARNING

Students don't learn as the result of what teachers do, but as a result of what teachers get them to do. This basic principle is as important for students to understand as it is for teachers. The student who expects to learn by simply sitting back and listening is likely to be disappointed. The teacher, on the other hand, who relies solely on the "I'll lecture, you listen" type of teaching is not likely to see much learning take place.

Why is this? Learning is change--behavioral change in an individual. Behavioral changes don't truly become a part of a person until he has reinforced them through use. For example, a student can memorize the operation of a piece of equipment or a new word for his vocabulary. But he doesn't actually "learn" those things until he practices operating the equipment or using the new word. The student, in short, must be involved in the process learning.

Basic Laws of Learning

The Law of effect - people tend to accept and repeat responses which are pleasant and satisfying, and to avoid those which are annoying. If an adult enrolls in a course expecting to learn to read, and quickly finds that he is learning and enjoying the learning process, he will tend to want to keep returning to class. Moreover, he probably will want to enroll in more courses upon completing the first one. In short, "nothing succeeds like success." Students should experience personal satisfaction from each learning activity and should achieve some success in each class period by mastering some new idea or operation.

The Law of primacy - First impressions are the most lasting. This means that those first classes are all important. The teacher should arouse interest, create a sense of need for the subject matter, and insure that the students learn it right the first time.

The Law of exercise - The more the act is repeated, the more quickly a habit is established. Practice makes perfect--if the practice is the right kind. Practicing the wrong thing will become a habit, too--one which is hard to break. The teacher should be sure that his students are performing an operation correctly.

The Law of disuse - A skill not practiced or a knowledge not used will be largely lost or forgotten. The teacher should recognize the value of repetition in the classroom for reinforcing newly gained knowledge or skills. Studies have shown that the period immediately following the learning process is the most critical in terms of retention. Important items should be reviewed soon after the instruction.

The Law of intensity - A vivid, dramatic, or exciting learning experience is more likely to be remembered than a routine or boring experience. This doesn't mean the classroom should be a circus or a theatre-in-the-round. But, on the other hand, the teachers (and their subjects) longest remembered are those who had the ability to "make their subjects live." By using vivid examples and other supporting material, teaching can be dramatic and realistic.

THE REINFORCEMENT PRINCIPLE OF BEHAVIOR AND THE HUMAN ADULT

Reinforcement may be a bit of food to a hungry animal, water for a thirsty one, the sight of mother for the human infant, or, for the infant duckling, the sight of whatever object on which its affection was stamped during the process of "imprinting." In a hundred thousand cages over the past 35 years, a million rats, pigeons and other small animals have shown that the rate of pecking a key on the wall of a cage or pressing a bar protruding above the food cup is highly dependent on the reinforcement which the animal receives. The generality of the principle was demonstrated when the same results were obtained with chimpanzees, human infants and other primates. Whatever actions immediately precede reinforcement undergo an increased likelihood of recurrence. When the experimenter arranges it so that each depression of the bar or peck on the key will be followed by food, the rate of those actions increase; when food no longer comes, it declines. How long it takes for the bar-pressing to stop entirely depends on the reinforcement schedule set up by the experimenter. (In some experiments, animals do not receive reinforcements after every "response.") The consequences of the animal's action--whether reinforcement or nonreinforcement--produce reliable changes in his subsequent behavior. Each reinforcement strengthens the immediately preceding action, and behavior is thus controlled by its consequences.

By "consequence" is meant whatever happens immediately after; there may be a logical connection, or, the reinforcing event may be an accidental occurrence that would have happened even if the behavior had not occurred.

The question arises whether this reinforcement behavior principle also applies to the behavior of a man. Is a human adult also likely to repeat any action followed by a satisfying (reinforcing) event, even when the person knows that there could only have been an accidental and entirely fortuitous relationship between his behavior and the "reinforcement?" Suppose that as I sit here at my typewriter, my son comes into the room shouting, "Hey! I got an 'A' in Math!" and that just prior to his coming in, I had made a typing error. It is obvious to me that, as pleasing as it is to have my little boy bearing such good news and looking so happy, neither my writing the paragraph, nor my making that mistake, could conceivably be the cause of his performance in arithmetic. If my behavior had anything at all to do with the happy event, that behavior occurred a long time ago. Maybe I helped by providing him with comfort and security, with the conditions essential to physical health, maybe by giving him his own room, and turning the television set off during the evening. Whatever it was I might have done, it certainly was not the paragraph or the error. Am I to believe that those behaviors could have been strengthened and made more likely to recur because my son burst into the room with good news when he did? A baby's behavior, a white rat's, or a dog's may have been demonstrated to follow this principal of automatic behavioral control by reinforcement consequence. But does it apply to me?

The Reinforcement Principle of Behavior and the Human Adult

There are strong opinions on both sides. Some writers claim that the ability to be unaffected by "consequences" which bear no logical relation to behavior is the very mark of humanness. Man, they say, is rational, human--not a beast, and not a machine. On the other side of the issue, it is said that man will be harmed by falsely trying to elevate himself above animal and machine. Only by acceptance of our beast-like or machine-like characteristics can we hope to exert control over them. Those who oppose conceiving of man's behavior as controllable by reinforcement are concerned lest man lose his "humanity" or be subject to domination by others. Those who accept the possibility that behavior obeys knowable laws are concerned lest important facts be overlooked. They see an analogy between opposition to the concept of laws of behavior, and opposition, in the 17th Century, to Galileo's contention that the earth was not in the center of the universe. However much Galileo's opponents wanted the earth to be the focal point of all things, however much they believed in the earth's central position in the grand design, the actual relation of the earth to other heavenly bodies was unaltered by their refusal to look into the telescope. Similarly, if man's behavior is controlled by its immediate consequences, wishing it were not so, however sincerely, will not change the process.

Yet common sense suggests that the adult human is vastly different from the white rat. According to common sense, I may have an increased likelihood of doing things which seem to be logically and causally related to the event, such as making sure that my children have an adequate diet and a quiet time to study. But it seems ridiculous to imagine that I will be a less adequate typist or have a stronger tendency to write on a certain topic because my son is a good student and announces it while I happen to be at the typewriter.

One trouble with this reasoning is that common sense has been notably defective in the past. Since maggots always appear on spoiled meat, it seemed obvious that the maggots came from the meat. But when meat was placed in a jar with a cover made of fine screen which kept flies and maggots out, but let odors escape, maggots appeared on the screen, but not on the meat. However, when Leeuwenhoek, as the result of this and of his observations using the newly invented microscope, asserted that the spontaneous generation of living matter from nonliving matter is an impossibility, he was believed to have lost hold of his common sense. It still seems obvious that heavy objects fall faster than light ones, and indeed they do when there is friction, as in the case of a feather wafting through the air, or of objects whose fall is impeded by a parachute, but most people do not realize that it is friction that produces the observed differences, and that on the moon (a four-pound piece of lead and a feather would touch ground at the identical instant. Or, for another example, to some people today, and to all peoples of a dark past, it is common sense that the male has nothing to do with the conception of a child.

The Reinforcement Principle of Behavior and the Human Adult

Common sense is dispelled by a process we designate with the term "science," but it is a mistake to think of science in too restrictive a sense. The methods of science are logic and observation, and no individual would survive for long if he did not possess some ability to use these methods. Our ancestor who noted the correlation between sexual behavior and pregnancy and advanced the theory that the two were causally related acted in the best of scientific traditions. It has been said that many of yesterday's scientific discoveries are today's accepted common sense views of the world. It once was common sense that a thunderstorm was caused by the wrath of God, yet today's conceptions of thunderstorms, even for the poorly educated, rarely include angry gods. That the blood circulates through veins and arteries is common sense today, but when Harvey postulated the existence of the then unseen capillaries, he was subjected to ostracism and ridicule. The history of science is replete with similar examples. Therefore, we cannot be comfortable about what today seems logical or obvious. We need the careful methods of observation and hypothesis-testing that characterize scientific research to tell us what our common sense views should be. Whether the reinforcement principle holds for the adult as it does for the infant is a scientific problem. The answer will be provided by further research.

In the meantime, we must remain uncertain. Perhaps man's ability to "think" is also his ability to allow events that happen now to strengthen behaviors that happened in the past, that unlike the infant and the beast, the human adult is not merely the automatic product of the fortuitous "consequences" of his acts. Or, there may be many occasions when the human adult is controlled, or partially controlled, in the automatic manner of the white rat. If he were not, he might have great difficulty adapting to the myriad conditions which make up his natural environment. If it were necessary for us to stop and cogitate at every turn, if the bulk of our behavior were not handled in a fairly automatic way, including the "automatic repetition of reinforced acts," we might be less, not more, flexible in our dealing with nature.

As we come to understand the processes of nature which control us, whatever they turn out to be, we may ourselves learn to control, indirectly, if not through conscious will, some of the behavior which we would like to change. After all, we are not, in truth, very happy about much of human behavior. War, racism, crime, drug addiction, alcoholism, automobile accidents, economic recessions, air pollution and overpopulation all represent behaviors we would like to change but have not found a way to influence effectively. There are many others which may seem less urgent but which combine to reduce severely the quality of human experience, for example, stuttering, vandalism, not attending class, bad teaching, poor performance on the job, psychosomatic illness, laziness and the generation gap. To learn more about what affects behavior increases the likelihood that we will be able to solve the problems which those undesired behaviors produce and to develop alternative behaviors which can be substituted for them. A start in this direction would seem to involve acceptance of the possibility that man's actions, even those of the intelligent human adult, may, at least in part, be an extralogical, automatic matter, which can be controlled only indirectly, through understanding of the natural laws of behavior.

The Reinforcement Principle of Behavior and the Human Adult

We should be receptive to scientific understanding of human behavior, just as we have learned to become receptive to changes in our conceptions of the physical universe and to the technological changes which have resulted from these changed conceptions. There is strong evidence that the human adult and the rat behave similarly under certain similar conditions. While we may not like to think of ourselves as rat-like, we should evaluate the evidence, rather than draw our conclusions on the basis of superstition and prejudice. We can be comforted in the knowledge that science is a most human of ventures; no rat ever followed the logic of a syllogism, or built a computer. Does the rat really represent so great a threat to us in intellectual accomplishment that we must defensively deny whatever useful similarities permit our learning from caged Rattus rattus instead of from caged Homo sapiens?

The hoped-for outcome of behavioral science is the improvement of the human condition. How those who have undertaken to engage in first-line fighting for psychological knowledge go about it, the apparatus they use, the species they use (in the impossibility, or undersirability, of subjecting humans to the controlled conditions of laboratory research), their experimental designs and research tactics are hard to evaluate. The layman might do a better job, or at least not feel so "out of it," the more scientific training he has had, which is a sound reason for increasing the emphasis on behavioral science at lower educational levels. But some gap always exists between the scientist himself and his ultimate audience, particularly during that long trial and error period in which new theoretical approaches are being groped for, tentatively formulated and subjected to their first early testing.

Like an expectant father, we sometimes find it hard to wait passively in the anteroom during the birth process. As well we might. We are, after all, called upon to pay the bills. And we are very eager for promising offspring of scientific investigations. But it is a mistake to think of science as a secret, mysterious process conducted in dark recesses of university corridors and laboratories. To conceive of science in such a way is to be unaware of its basically public nature. The scientist works not in a vacuum, but in a social milieu. The hallmark of his professional competence is his ability to communicate his procedures and findings to others. The responsible public neither rejects nor accepts out of hand, but listens, learns and inevitably, but not precipitously, on the basis of careful attention to the evidence from all sides, makes tentative evaluations.

It seems that the time for responsible lay evaluation of the reinforcement principle and its possible application to human behavior has not yet come. This is still a wait-and-listen time; research findings accumulated so far, while consistent with the principle, do not provide overwhelming evidence that reinforcement underlies all human behavior, nor is it clear to what behaviors it is likely, or not likely, to apply. What seems to be the case, at this point, is that the reinforcement principle provides a usable basis for setting up guidelines for effective behavior management in certain situations, for example, in schools and other institutions. Perhaps, it will turn out that as Newton's physics was incorporated by later physical theories, the reinforcement principle may prove to be a rather crude approximation to an as-yet-undreamed-of more adequate formulation of the laws of

The Reinforcement Principle of Behavior and the Human Adult

human behavior. But right now, it works in some situations, and all that is really essential is that scientists and educators and others be permitted to continue to explore possibilities of putting the principle to use. Perhaps, in the course of this work, other discoveries will be made. Perhaps the golden age of humanity will come, not in spite of, but because of, our acceptance of the demonstrated application of the principle of reinforcement, even its possible application to the behavior of the human adult.

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LEARNING THEORIES FOR TEACHERS
TABLE 1. Representative Theories of Learning

Theory of Learning	Assumption Concerning the Basic Nature of Man	Psychological Systems or Outlook	Basis of Transfer	Key Persons	Contemporary Exponents
1. Mental discipline	bad-active (mind substance)	faculty psychology	exercised faculties, transfer automatic	St. Augustine John Calvin J. Edwards	many Hebraic-Christian fundamentalists
2. Mental discipline	neutral-active (mind substance)	classicism	cultivated mind or intellect	Plato Aristotle	M. J. Adler St. John's College
3. Natural unfoldment	good-active (natural)	romantic naturalism	recapitulation no transfer	J. J. Rousseau F. Froebel	extreme progressivists
4. Apperception	neutral-passive (mental)	structuralism	apperceptive mass	J. F. Herbart E. B. Titchener	many teachers and administrators
5. S-R Bond	neutral-passive (physical or mental)	connectionism	identical elements	E. L. Thorndike	J. M. Stephens A. I. Gates
6. Conditioning (with no reinforcement)	neutral-passive (physical)	behaviorism	conditioned responses	J. B. Watson	E. R. Guthrie
7. Reinforcement and conditioning	neutral-passive (organism)	reinforcement	reinforced, or conditioned, responses	C. L. Hull	B. F. Skinner K. W. Spence
8. Insight	active (natural)	Gestalt psychology	transposition of insights	M. Wertheimer K. Koffka	W. Kohler
9. Goal insight	neutral-interactive	configurationalism	tested insight	B. H. Bode	E. E. Bayles
10. Cognitive-field	neutral interactive (psychological)	field psychology or relativism	continuity of life spaces, experience, or insights	Kurt Lewin E. C. Tolman J. S. Bruner	R. G. Barker A. W. Combs H. F. Wright

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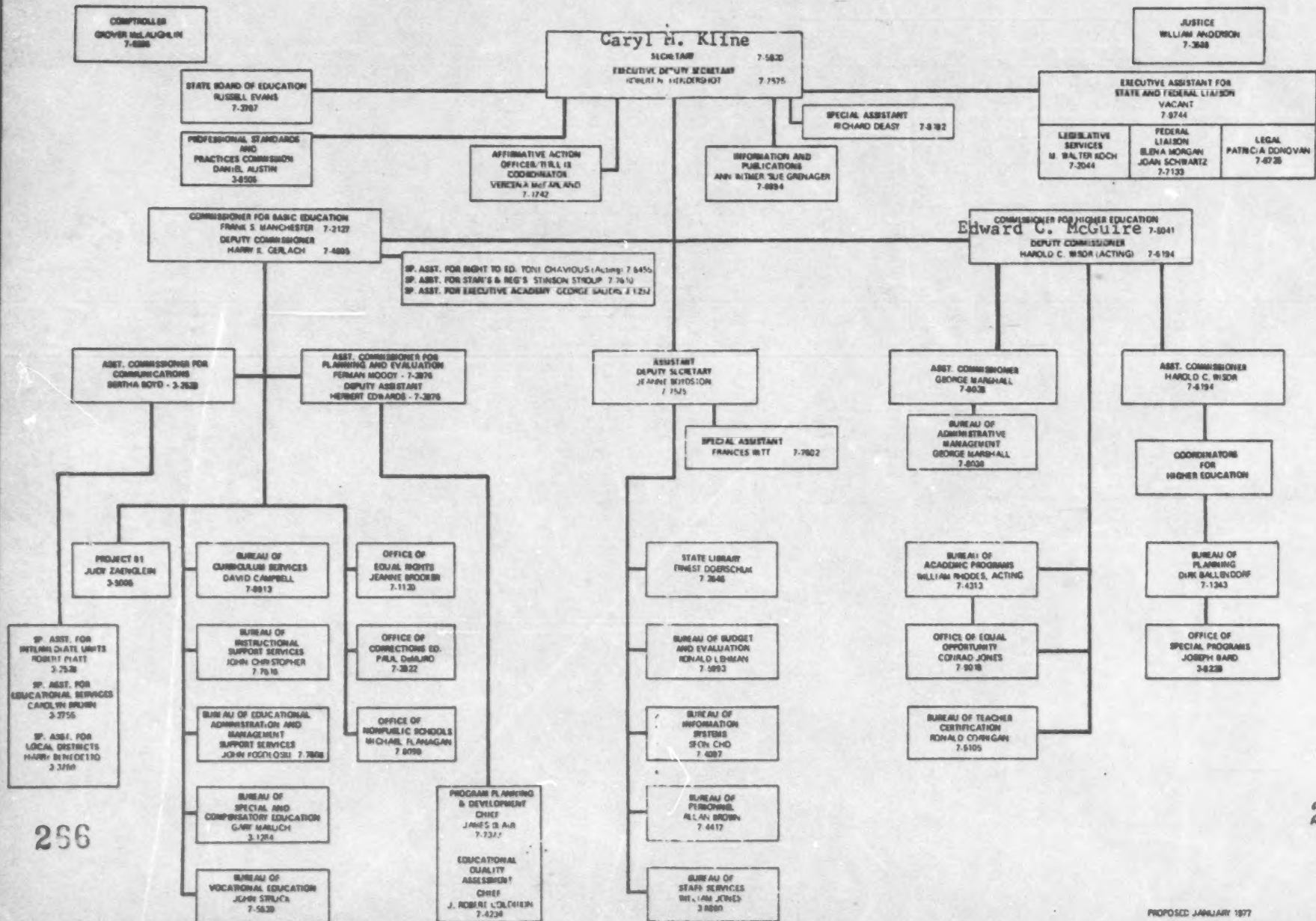
Bigge, Morris L. Learning Theories for Teachers. New York: Harper & Row, 1964, pp. 12-13.

STATE GOALS FOR VOCATIONAL EDUCATION IN PENNSYLVANIA

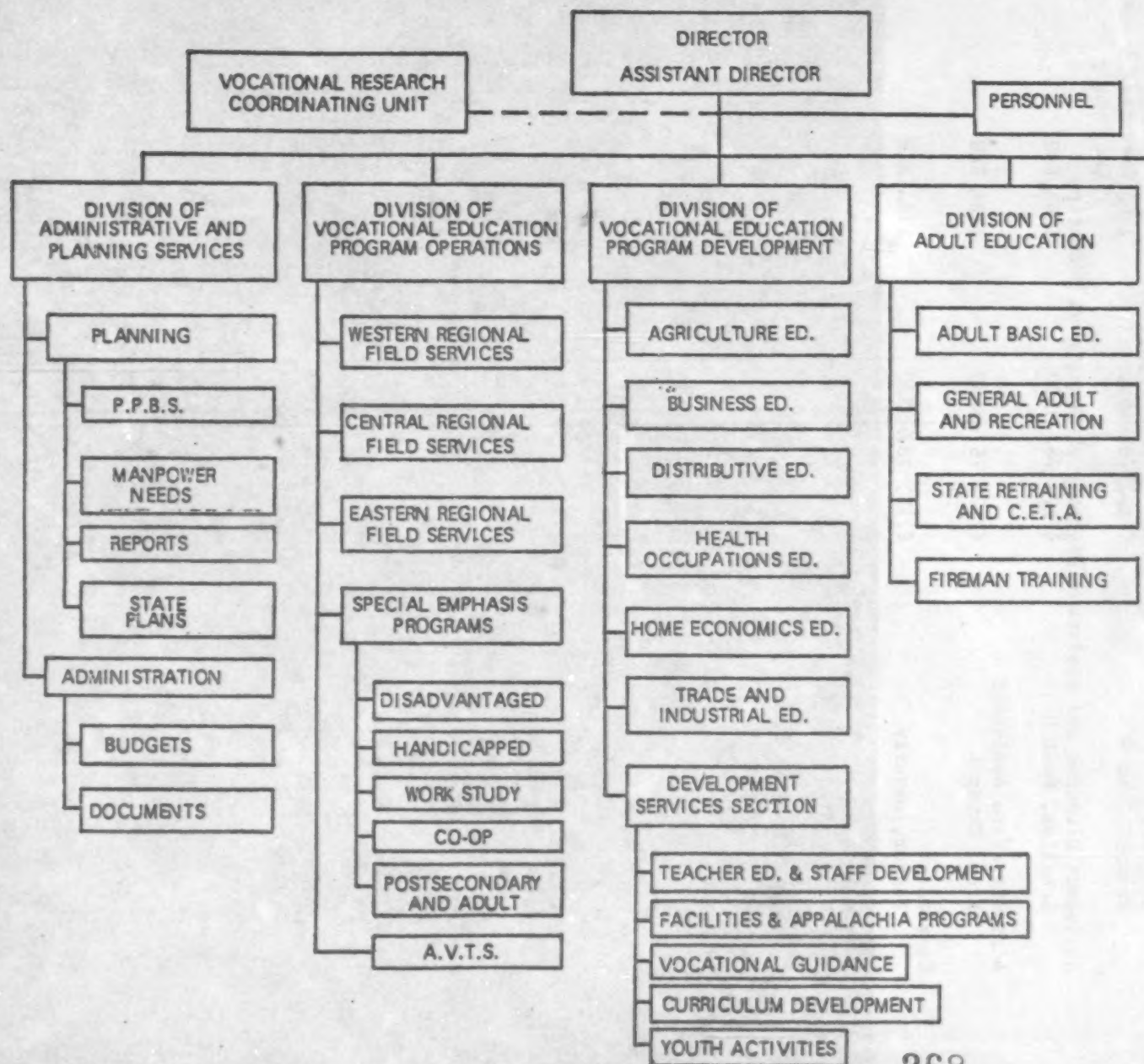
The State Board of Education recognizes the increasing complexity and rising costs associated with providing educational services for all citizens of the Commonwealth. It is imperative that: (1) accountability be an integral part of planning; (2) existing and prospective educational programs be monitored and evaluated; (3) outdated and unnecessary duplication of programs and services be eliminated; (4) educators justify their educational expenditures to the public; and (5) representatives of all educational levels participate in determining the optimum delivery system for meeting educational needs of the public. Considering these points and, in an effort to provide a clear direction for vocational educators, the State Board of Education has adopted the following goals to guide vocational education for the next five years.

- I. Develop, expand or modify quality vocational education so that by 1982 every public secondary student will have had the opportunity to: (1) enter the labor force with a marketable vocational skill; (2) learn a useful vocational skill; or (3) acquire a basic vocational skill and continue at the postsecondary level.
- II. Promote the expansion, range and diversity of adult and postsecondary occupational education opportunities to facilitate: (1) the entry/reentry of persons into the labor force and; (2) to provide upgrading or retraining for persons already employed/unemployed.
- III. Encourage alternative forms of vocational/occupational education to broaden the options available to students.
- IV. Intensify articulation efforts between secondary and postsecondary vocational/occupational programs.
- V. Support a greater understanding of educational/career options by expanding vocational guidance, counseling, and job placement services and providing occupational experiences for students.
- VI. Foster a concerted effort to achieve equal educational opportunities by eliminating sex, racial/ethnic and linguistic bias, stereotyping, and discrimination.
- VII. Strengthen the development and implementation of comprehensively planned programs to meet the needs of and demands for competent professional vocational teachers, counselors, supervisors, and administrators.
- VIII. Develop and expand vocational education opportunities for the disadvantaged and handicapped.

COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF EDUCATION



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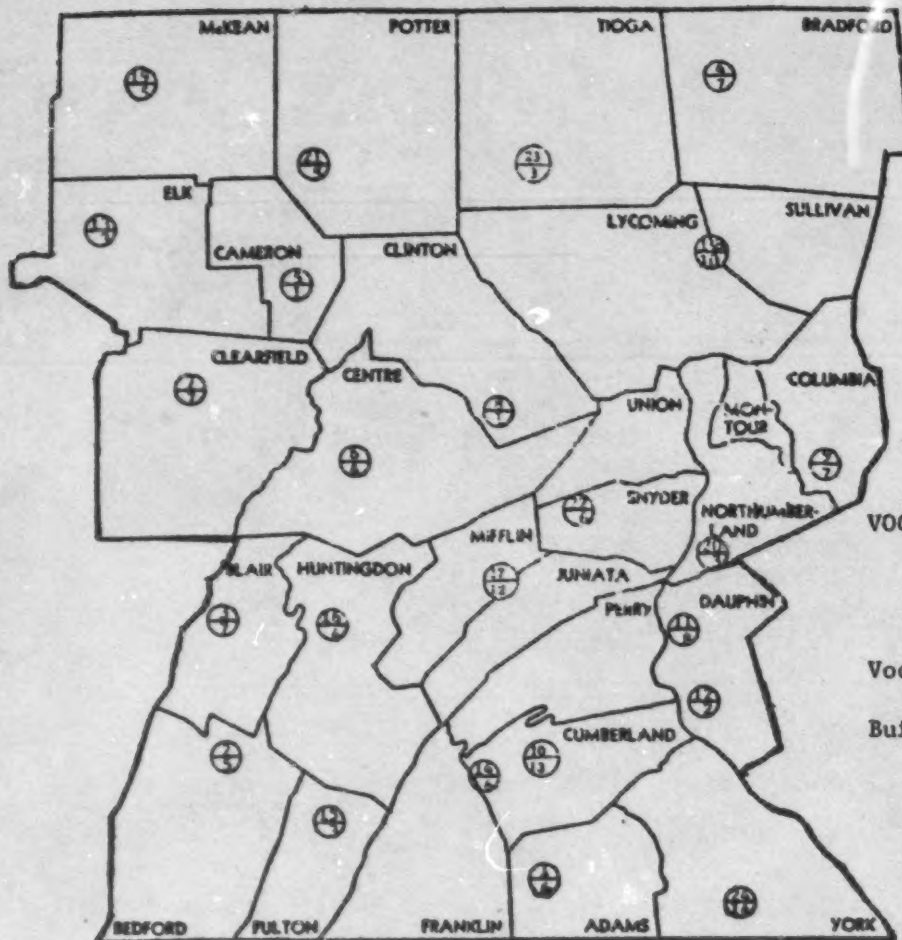
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The number in the upper half of the circle identifies the vocational educational planning unit in each region. The number in the lower half of the circle denotes the number of school districts in the planning unit.



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Appendix c

Selected Handout Materials Utilized in the Evaluation
in Health Occupations Education Workshop

F. Marvin Hole, Ed.D.

Department of Vocational Education
The Pennsylvania State University
Health Occupations Education

TERMINOLOGY

Advisory committee--a group of knowledgeable persons in a content area chosen to advise regarding selected aspects of a vocational program but having no final decision-making powers.

Allied health occupations--workers that provide direct and indirect support to health and related professions.

Health Occupations Education--preparation of persons to support health professions in providing diagnostic, therapeutic, preventative, restorative, and rehabilitating services to people.

Paradental worker--person who provides direct support to dental professions.

Paramedical worker--person who provides direct support to medical professions.

Aide--health worker who is trained on-the-job in a short term program and works under the direct supervision of a professional.

Assistant or Technician--level of worker between an aide and a professional trained, usually in a two-year program to assume some duties of the professional.

Paraprofessional--worker to provide direct support to the professional.

Professional--a person educated at a bachelor's degree or above and acts as an independent practitioner.

Technologist or Therapist (AMA)--a person prepared at a bachelor's degree level in a particular health field and can supervise other workers.

Core--common to many occupational curriculum. Certain units, courses, or other portions of the educational program that are fundamental and foundational to a single curriculum or to several curricula.

Cluster--a number of similar occupations or specific subject content considered as a group or family because of their relation to each other.

Ladder--upward or downward mobility of the worker within a specific occupational field.

Lattice--mobility of the worker horizontally, upward, or downward within a specific field or between closely related fields.

Equivalency test--test to determine if person has achieved the knowledge in skill equal to that of formal instruction.

Proficiency test--a test to evaluate the level of competency of a person in specific skills or knowledges--usually related to upward mobility.

Accreditation--a voluntary process for agency approval of a program or institution in meeting certain standards.

Certification--a voluntary process of a worker by a professional society to indicate standards of education, experience, and qualifications.

Credential (teacher)--an indication of person's qualifications relating to vocational work experience and course work.

Licensure--under state authority, laws are enacted setting minimal qualifications for persons and practicing standards.

Registration--used interchangeably with certification or licensure in relation to listing of a person by professional association.

EVALUATION DESIGN WORKSHEET

PURPOSE: Why evaluate?

AUDIENCES: Who is the evaluation for?

ISSUES: What questions should the evaluation address?

RESOURCES: What resources are available for the evaluation?

EVIDENCE: What evidence should be collected?

DATA-GATHERING: How is the evidence to be collected?

ANALYSIS: How can the evidence be analyzed?

REPORTING: How can evaluation findings be reported?

POSITION PAPER
HEALTH OCCUPATIONS EDUCATION

A. Louise Harding
March, 1975

HEALTH OCCUPATIONS EDUCATION

This paper is intended to assist vocational consultants assigned to regional field offices who do not have a background in Health Occupations Education or who are newly appointed consultants with a Health Occupations Education specialty. It is hoped that this information will adequately familiarize consultants with some of the problems and needs for expansion and improvement of Health Occupations Education Programs in Pennsylvania.

The health delivery system is one of the largest employing industries. Health workers at all levels in a wide variety of employing agencies are required if the services now provided through paid insurances are to be adequately met. Reduction in health care costs can be achieved when educational systems realize the necessity for preparing workers under public vocational support.

THE PROGRAM

Health Occupations Education is a program area of Vocational Education which provides instruction and selected learning experiences for preparing health workers below the professional level. Specifically, instruction for Health Occupations Education can prepare youth and adults to become safe and competent workers as well as for those individuals employed in Health Occupations to become more effective in their work. Courses may be offered in Area Vocational Technical Schools, comprehensive high schools and community colleges.

Curriculums must be planned to provide a secure general base on which career development and mobility is possible with a minimum of wasted time and effort. At the same time equality of the program shall be maintained within recognized standards to ensure employability.

Education for health workers must include a substantial portion of clinical experience related to the instruction. Such clinical experience is an extension of the school laboratory into the clinical setting planned and supervised by the instructor of the program.

The time element in any planned program of instruction is dependent upon the skills required for employment and the learning ability of the student. Care must be taken to prevent overteaching or teaching beyond the depth and scope of the job for which the student is being prepared. Contrary to popular belief that added knowledge makes an individual a better worker, such practice in the health field may prove disastrous or even illegal since licensure of some workers restricts what may be taught for non-licensed occupations.

CONSTRAINTS

Certain constraints are placed upon administration and operation of a number of health occupations educational courses by a number of outside agencies. Awareness of these constraints is essential:

- 1) Regulation of practice as approval of programs by state licensing boards. Mandatory licensure requires a practitioner in a particular occupation to be licensed within the state. All nursing, medical practice, dentistry, etc. are regulated by mandatory practice acts in Pennsylvania. The respective licensing boards also are empowered with responsibility of approval and supervision of schools and/or programs preparing the practitioner. Any local educational agency desiring to initiate programs in Health Occupations should become familiar with the state practice acts governing the approval of programs and licensing of graduates.
- 2) National registries or certifying boards have been established by the various health professions and related allied groups. These agencies have established educational criteria and standards for approval of programs which qualifies graduates to be registered or certified on a national basis. These boards provide guidelines for developing accredited programs and annually publish lists of accredited schools. Although national certification or registration are not mandatory for employment, common employment trends favor this route.

Licensing and certification place constraints upon the operation of these programs at the secondary level. Agencies responsible for establishing criteria for approval of programs/courses have established regulations requiring the program to be offered at the post-high school level. Maturity and required patient and/or clientele contact are important factors contributing to this regulation.

THE SECONDARY PROGRAM

Since national certification is not a requirement for employment a number of courses not regulated by mandatory licensure can be operated at the secondary level to a degree of success. In all fairness to students they must be informed that the high school curriculum does not prepare them for such certification.

Implementing a Health Occupations Education course at the secondary level requires a number of special considerations. Courses in which skills involving direct patient contact are taught should include planned clinical experience in a health delivery agency such as a hospital, convalescent home, medical or dental office, clinics, etc. This experience is an integral part of the course. It must be differentiated from cooperative education in that the school contracts with a health agency to extend the school laboratory into a clinical setting. Clinical experience is under the complete supervision and control of the teacher of the local educational agency. The experiences must be well selected to avoid student exploitation. Students are not paid. Adequate experience must be available. The tasks performed are considered laboratory experiences rather than employment. There is no known way to ensure high-quality performance without providing for significant experiential learning in the actual health care environment.

Arrangements for clinical experience require written agreements for the protection of both the school and the cooperating agency. Transportation may prove to be a constraint and should be discussed before making the decision to open a course. It is further necessary to determine how the student and the teacher are covered for liability (malpractice) insurance.

Some agencies will request that individuals coming in contact with patients and/or clientele be properly identified, meet certain requirements for dress and have had physical examinations including specific immunizations. In this case, admission requirements to the course will need to be set accordingly.

Age is an important factor in placing students in clinical facilities. For this reason clinical experience should be delayed until the student exhibits maturity and meets the required age for performing in these agencies.

Curriculum content for these courses should be carefully phrased to avoid using terminology implying the instruction of any occupation which is regulated by law.

Advisory committees prove very valuable when local professional groups are represented. Many misunderstandings can be prevented by establishing good rapport between appropriate professionals and the school authorities. This is accomplished by securing nominations from organized groups to represent them after discussing with these groups the purposes of the committee. This committee should be called upon frequently enough to keep their interests high.

Secondary programs should be planned in such a way that students can also receive a good academic background. This is especially true if anyone wishes to continue in a post-high school educational career in the health field. Chemistry, in particular, is a course offering that is essential for entrance into a post-secondary health career. For the student's benefit health occupations educational courses are best confined to the eleventh and twelfth grades of the secondary school.

The most common of all secondary courses is Health Assistant. This is a one-year cluster course of approximately four hundred eighty hours which provides basic instruction for preparation of assistance in five broad categories: nursing, dental, medical, medical laboratory and home care. The course may prepare for job entry level employment: serve as the basis for specialization such as dental assisting, medical assisting, etc.; assist students in choosing a post-high school health career.

In any courses taught in the health occupations education area, great caution is urged in expecting teachers to become responsible for teaching those skills for which they are not qualified to teach. While typing and shorthand may be skills used in the health occupations, the health specialty teacher merely assists students in making a transfer of these skills to the program area. Typing and other basic business office skills are not taught as a part of the course!

Facilities for secondary courses of health occupations education are best planned with classroom and laboratory in one room. Work areas should occupy periphery of the facility to make demonstrations more visible to everyone. Some courses require X-ray. All radiologic equipment as well as the area in which it is to be used must be approved by the Pennsylvania Department of Environmental Resources. All such equipment must be registered with this Department (functional or not) and inspected periodically. The local educational agency must specify if the facility is to be used for provisions of clientele services as well as a teaching area since requirements for lead shielding may vary accordingly. This Department of Environmental Resources also stipulates the maximum allowable exposure of students to X-rays.

Local educational agencies should be cautioned against purchasing equipment which is costly and quickly outdated as well as dangerous to operate. In most instances,

principles of technics can be taught in the classroom, followed by demonstrations and practice in the clinical facility where operation is far less hazardous.

When a number of courses are offered in the same building, facilities should be shared rather than duplicated. Team teaching may also be advisable to capitalize upon the expertise of all teachers.

THE POSTSECONDARY PROGRAM

A number of postsecondary health occupations education programs operate throughout the Commonwealth. Foremost among these is the practical nursing course which can be conducted in comprehensive high schools, area vocational-technical schools and community colleges. These programs must be approved by the State Board of Nurse Examiners in order for graduates to be eligible for licensure. The senior program specialist of health occupations education serves as the liaison person between these programs and the State Board of Nurse Examiners, making it necessary for approval to be cleared through the Bureau of Vocational Education. The State Board of Nurse Examiners refuses to act upon any requests not submitted through this particular route.

Other postsecondary health occupations education programs usually are conducted within the criteria of national certifying boards making graduates eligible for certification or registration.

STATE OBJECTIVES

1. Encourage development of secondary health occupations education programs in the comprehensive high school.
2. Plan for articulation between secondary programs and community colleges to permit advance standing for associate degree and eligibility for certification.
3. Continue to work toward recognition of secondary preparatory programs with hope for receiving recognition of these programs for certification purposes.
4. Encourage and provide inservice teacher education for health occupations education teachers throughout the Commonwealth. This is necessary because there is no organized teacher education for teachers in health occupations education.
5. Emphasize and encourage on a statewide basis the development of programs for health workers at all levels: secondary, postsecondary and adults.

ARTICULATION PATTERNS

Articulation experiences have been offered in a variety of pilot patterns:

- 1) Articulation between secondary health assistant students and practical nursing.

- 2) Practical Nursing and ADN articulation has been accomplished in a number of different ways.

True articulation should consider sharing of equipment, facilities and teaching and should be differentiated from advanced placement. The latter provides opportunity on an individual basis for allowance of credit toward certain curriculums at particular levels of the course. Advanced placement has been more frequently practiced than articulation.

SPECIAL HINTS IN COURSE PLANNING

In addition to specific hints mentioned in material thus far, the following tips are presented:

- 1) Care must be taken to avoid overuse of professional persons as guest lecturers who may present material too technical for the student's level of function.
- 2) If in the practice of certain procedures the student's skin is to be punctured to obtain samples of any type, permission of parent or guardian must be obtained.
- 3) Become aware of licensure, registration and accreditation requirements which affect decisions about qualifications of students, curriculum development, faculty needs and general feasibility of opening the program.
- 4) Determine whether students will be available in sufficient numbers to permit adequate class size.
- 5) Venipuncture should not be taught to any secondary pupils.

HEALTH OCCUPATIONS EDUCATION COURSES

07.0101 DENTAL ASSISTING--Secondary, postsecondary, adult.

A combination of subject matter and experiences designed to prepare a person to assist the dentist at the chairside in the dental operator, to perform reception and clerical functions, and to carry out selected dental laboratory work.

07.0102 DENTAL HYGIENE (Associate Degree)--Postsecondary only.

A combination of subject matter and experiences designed to prepare a person to provide services to patients, such as performing complete oral prophylaxis, applying medications, and providing dental health education services, both for chairside patients and in community health programs, under the supervision of the dentist.

07.0103 DENTAL LABORATORY TECHNOLOGY--Secondary, postsecondary, adult.

A combination of subject matter and experiences designed to prepare a person to execute the work in producing restorative appliances required for the oral health of the patient as authorized by the dentist.

07.0200 MEDICAL LABORATORY TECHNOLOGY (Associate Degree only).

Planned subject matter and laboratory experiences concerned with bacteriological, biological, and chemical tests to provide data for use in diagnosis and treatment of diseases--using microscopes, micrometers, and other instruments. Persons prepared in this area usually work under the supervision of medical technologists, clinical pathologists, or physicians.

07.0203 MEDICAL LABORATORY ASSISTING--Secondary, postsecondary and adult.

A combination of subject matter and experience designed to prepare a person to work under the supervision of medical technologists, clinical pathologists, or physicians to perform routine clinical laboratory procedures.

07.0301 NURSING (Associate Degree)--Community Colleges only.

A combination of general and nursing education and clinical experiences designed to prepare a person for general-duty nursing under the nurse supervisor or physician, or with other members of the health team.

07.0302 PRACTICAL NURSING--Postsecondary only or adult supplemental.

A combination of subject matter and supervised clinical experiences designed to prepare a person to give direct nursing care under the supervision of a nurse or physician.

07.0303 NURSING ASSISTANTS (Aid)--Secondary, postsecondary and adult.

A combination of subject matter and experiences designed to prepare a person to perform simple tasks involved in the personal care of individuals receiving nursing services. These tasks are performed under the supervision of nurse.

07.0304 PSYCHIATRIC AIDE--Postsecondary and adult.

A combination of subject matter and experiences designed to prepare a person to care for mentally ill patients in a psychiatric medical care facility under direction of nursing and medical staff. Included is instruction in patient hygiene and grooming, feeding, obtaining laboratory specimens, observing patients for unusual behavior, methods of aiding in restraining patients to prevent injury to themselves or others and encouraging participation in social and vocational activities.

07.0305 SURGICAL TECHNICIAN (Operating Room Technician)--Secondary, postsecondary and adult.

A combination of subject matter and experiences designed to prepare a person to serve as a general technical assistant on the surgical team in the operating suite.

07.0307 HOME HEALTH AIDE--Secondary, postsecondary and adult.

A combination of subject matter and experiences designed to prepare a person to assist the elderly, convalescent or handicapped in their homes; to provide for their daily living needs which may be described as physical, mental, emotional, social and spiritual.

07.0309 HOME HEALTH MANAGEMENT ASSISTANT--Secondary, postsecondary and adult.

A combination of subject matter and experiences designed to prepare unlicensed nonprofessional workers who are prepared to give personal care to convalescent, disabled or chronically ill persons of all ages and to provide home management assistance to individuals and families. Personal care duties which may be performed are essentially those which would be performed by a nursing assistant in an institution and/or those which could be performed by a knowledgeable family member.

07.0401 OCCUPATIONAL THERAPY--Postsecondary and adult.

A combination of subject matter and experiences designed to prepare a person to assist the occupational therapist in implementing the plan of therapy for a patient as prescribed by a physician.

07.0402 PHYSICAL THERAPY--Postsecondary and adult.

A combination of subject matter and experiences designed to prepare a person to assist the physical therapist in implementing the plan of therapy for a patient as prescribed by a physician.

07.0501 RADIOLOGIC TECHNOLOGY (X-ray)--Postsecondary only.

A combination of subject matter and experiences designed to prepare a person for the safe use of X-ray equipment in clinical settings under the supervision of a radiologist or other physician.

07.0701 ENVIRONMENTAL HEALTH ASSISTANT--Secondary, postsecondary and adult.

A combination of subject matter and experiences designed to prepare a person to assist sanitary engineers, scientists, physicians, and veterinarians to gather data on, inspect and evaluate facilities and industries concerned by the public, such as water supply, the food industry and sewage disposal facilities and plants.

07.0800 MENTAL HEALTH TECHNOLOGY--Postsecondary only.

A combination of subject matter and experiences designed to prepare a person to assist professionals in the mental health services.

07.0901 ELECTROENCEPHALOGRAPH TECHNICIAN--Postsecondary.

A combination of subject matter and experiences designed to prepare a person to operate electrical equipment which records brain waves on a graph to be used by a medical practitioner diagnosing brain disorders. Instruction in minor repairs and maintenance of equipment may be included.

07.0902 ELECTROCARDIOGRAPH TECHNICIAN--Postsecondary only.

A combination of subject matter and experiences designed to prepare a person to operate an electrocardiograph machine, recording electromotive variations in the action of heart muscle, to provide data for diagnosis and treatment of heart ailments by a physician. Instruction in minor repairs and maintenance of equipment may be included.

07.0903 INHALATION THERAPY--Postsecondary only.

Preparation includes a combination of subject matter and experiences designed to prepare a person to perform procedures and operations and maintain equipment used in supporting respiratory functions, including the administration of oxygen and other sustaining gases, as directed by a physician.

07.0904 MEDICAL ASSISTANT--Secondary, postsecondary, adult.

A combination of subject matter and experiences designed to prepare a

person to perform functions and follow procedures concerned with diagnosis and treatment of patients in a physician's office. Instruction includes physical examinations, laboratory tests, X-rays, measurements and medication.

07.0905 CENTRAL SUPPLY TECHNICIAN--Postsecondary only.

A combination of subject matter and experiences designed to prepare a person to adjust, clean, and sterilize and assemble hospital equipment, supplies and instruments according to prescribed procedures and techniques. Also included in instruction are inspection, evaluation and recommendation for purchase of equipment and materials and distribution and inventory.

07.0906 HEALTH ASSISTANT--Secondary only.

The health assistant is an entry health worker prepared to serve as an assistant to a number of health professionals. This worker always works under the direct supervision of the professional person being assisted. The educational program is planned to provide a core of related instruction necessary to all practitioners in the health field. The curriculum also includes a very basic understanding of many of the simple skills performed by the well qualified assistant prepared in a specific course. It is intended to provide a knowledge and understanding of these techniques usually taught in on-the-job training of such workers. The student may upon completion of the course find a special aptitude for one specific area and pursue further education in accredited courses.

07.0907 MEDICAL EMERGENCY TECHNICIAN--Secondary, postsecondary and adult.

A combination of subject matter and experiences designed to prepare technicians to become members of the health team responsible to professional members qualified to: a) respond to medical emergency calls; b) evaluate the nature of the emergency; c) take appropriate prompt action to reduce the medical hazards to the receiving station; d) serve as technical assistant to the emergency room staff of general hospitals.

07.9901 HEALTH RELATED TECHNOLOGY--Secondary only.

This course has been designed for the academic pre-college student to pursue a curriculum in which certain vocational health skills are taught in sufficient quantity to permit the individual to spin off as an entry level worker in the health field.

07.9902 HEALTH ASSISTANT SPECIAL--Secondary only.

This course is designed for the second year of health assistant in which specialization of one of the areas is given.

09.0909 MORTUARY SCIENCE--Postsecondary only.

Prepare a person to perform the sanitary and embalming preparations for interment in conformity with legal requirements.

07.0910 ORTHOPEDIC ASSISTING--Postsecondary.

A combination of subject matter and experiences designed to prepare a person to assist an orthopedic specialist in preserving, restoring and developing the form and function of the extremities, spine and associated structures by medical, surgical and physical methods.

APPENDIX D
Letter of Transmittal Workshop
Evaluation Instruments

THE PENNSYLVANIA STATE UNIVERSITY

COLLEGE OF EDUCATION

Division of Occupational and Vocational Studies

RACKLEY BUILDING

UNIVERSITY PARK, PENNSYLVANIA 16802

January 30, 1978

Dear Participant:

As a participant in one or more of the 1977 Health Occupations Education Workshops held at The Pennsylvania State University, you are respectfully requested to complete the enclosed evaluation survey(s) for each workshop you attended and return to me before February 15, 1978, so that the evaluations may be included in the Final Report of this funded project.

Please give special consideration to the questions for health occupations topics to be offered in the future. Responses to these questions will provide guidance to the Bureau of Vocational Education and the Division of Occupational and Vocational Studies in planning future workshops.

Thank you for taking time from your busy schedule to answer the evaluation survey(s).

Sincerely,

F. Marvin Hole

F. Marvin Hole, Ed.D.
Assistant Professor of
Vocational Education

FMH/sra

Enclosures

Dental Assisting Activities for Health Assistant Teachers
Industrial Education 498Gv

The Pennsylvania State University
Division of Occupational and Vocational Studies
119 Rackley Building
University Park, PA 16802

Your evaluation of our services helps us design future workshop training which is effective and relevant to your needs. Therefore, please be as honest and as specific as you can in answering the following questions. Your comments will in turn, help design future workshops. Thank you!

INSTRUCTIONS: Listed below are the titles of each session presentation. In the space provided, indicate to what extent the information was utilized or implemented into your classroom.

Information gained from the workshop was utilized or implemented in your classroom:

- A. Immediately at the beginning of the school year.
- B. Later on in the school year.
- C. Within the next school year.
- D. At some future date, though I can foresee no immediate use for them.
- E. Never.

PRESENTATIONS:

Monday

- | | A | B | C | D | E |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Philosophy, History and Organization of Dental Assisting | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2. The Dental Team and How it Functions | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3. Basic Dental Anatomy | | | | | |
| a. Bones of Skull and Face | ☐ | ☐ | ☐ | ☐ | ☐ |
| b. Permanent and Deciduous Dentition | ☐ | ☐ | ☐ | ☐ | ☐ |
| c. Parts of the Teeth | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4. Surfaces of the Teeth - Morphology | ☐ | ☐ | ☐ | ☐ | ☐ |
| 5. Charting Methods, Common Conditions Found in the Oral Cavity | ☐ | ☐ | ☐ | ☐ | ☐ |
| 6. Activity: | | | | | |
| a. Dental Cements | ☐ | ☐ | ☐ | ☐ | ☐ |
| b. Restorative Materials | ☐ | ☐ | ☐ | ☐ | ☐ |

PRESENTATIONS (Continued):Tuesday

1. Dental Materials - Matrix
 - a. Lecture
 - b. Demonstration
2. Dental Instruments and Burs
3. Activity:
 - a. Tray Set-Ups
 - b. Four Handed Dentistry
 - c. Instrument Transfer
 - d. Oral Evacuate

A	B	C	D	F
☐	☐	☐	☐	☐
☐	☐	☐	☐	☐
☐	☐	☐	☐	☐
☐	☐	☐	☐	☐
☐	☐	☐	☐	☐
☐	☐	☐	☐	☐

Wednesday

1. Radiology of Dentistry
 - a. Hazards of Dental X-Rays
 - b. Legal Limitations in Dental Radiology
2. How to expose Dental X-Rays
 - a. Bisecting Angle
 - b. Parallel
3. Activity:
 - a. Position X-Rays with Partner
 - b. Charting exercise
 - c. Oral Evacuate
 - d. Tray Set-Ups
 - e. Matrix Set-Ups

☐	☐	☐	☐	☐
☐	☐	☐	☐	☐
☐	☐	☐	☐	☐
☐	☐	☐	☐	☐
☐	☐	☐	☐	☐
☐	☐	☐	☐	☐
☐	☐	☐	☐	☐

Thursday

1. Radiology in Dentistry
 - a. Taking Bite Wing X-Rays
 - b. Developing Penapical and Bite Wing Dental X-Rays
 - c. Mounting Full Mouth Series
2. Activity
 - a. Positioning Bite Wing X-Rays
 - b. Exposing X-Rays
 - c. Develop Exposed X-Rays
3. Gypsum Products
 - a. Working with Dental Plaster and stone
 - b. Pouring Models

☐	☐	☐	☐	☐
☐	☐	☐	☐	☐
☐	☐	☐	☐	☐
☐	☐	☐	☐	☐
☐	☐	☐	☐	☐
☐	☐	☐	☐	☐
☐	☐	☐	☐	☐

Friday

1. Patient Education
 - a. Preventive Dentistry
 - b. Home Care
2. Importance of Restorative Dentistry and Specialities

☐	☐	☐	☐	☐
☐	☐	☐	☐	☐

Check each statement below which expressed your feelings about the workshop.
In some cases, you may wish to check more than one answer per question.

1. Overall, the workshop was:

- ☐ Very worthwhile in terms of answering my immediate needs.
☐ A worthwhile experience, though some of my immediate needs were not met.
☐ Of limited value.
☐ Comments: _____

2. The amount of time spent on lecture:

- ☐ Was too extensive.
☐ Was about right for the material presented.
☐ Was inadequate for the kind of materials presented.
☐ Could better have been spent on other activities.
☐ Comments: _____

3. Small group meetings:

- ☐ Were effectively incorporated into the workshop.
☐ Should have been included, but were not.
☐ Were not necessary and were not included.
☐ Added nothing to workshop effectiveness and should have been omitted.
☐ Comments: _____

4. Audiovisual presentations:

- ☐ Were used with great effectiveness.
☐ Were not as effectively used as they might have been.
☐ Were not used, but would have been helpful.
☐ Were not necessary for this workshop and were not used.
☐ Were relied upon too heavily.
☐ Comments: _____

5. Opportunity for discussion:

- ☐ Was adequate and greatly helped the group's understanding of topics presented.
☐ Was limited, but adequate for purposes.
☐ Was inadequate.
☐ Comments: _____

6. On the whole, this workshop was:

- ☐ More effective than others I've attended.
☐ Similar to others of its type I've attended.
☐ Not as effective as others.
☐ This is the first workshop of this type I've attended.
☐ Comments: _____

7. As a participant, I felt:

- ☐ Very welcome to ask questions or seek additional help at any time.
☐ Welcome to ask questions when they were asked for.
☐ Somewhat uneasy about asking questions.
☐ Comments: _____

8. I intend to implement methods or material introduced in this workshop.

- ☐ Immediately.
☐ Within the next year.
☐ At some future date, though I can foresee no immediate use for them.
☐ Never.
☐ Comments: _____

Briefly answer the following questions. Please be as specific so that your answers will help us design future workshops.

1. What part of the Program was of most value to you as a Health Occupations educator?

2. What part of the Program was of least value to you?

3. What topics would you like offered at the next workshop?

4. What would you consider the single most important concept gained from this workshop?

5. Please describe your overall reaction to the workshop. (Was it what you expected, useful, suggestions for improvement!)

Methods of Instruction for Health Occupations Teachers
Industrial Education 498Hv

Dr. F. Marvin Hole
The Pennsylvania State University
Division of Occupational and Vocational Studies
119 Rackley Building
University Park, PA 16802

Your evaluation of our services helps us design future workshop training which is effective and relevant to your needs. Therefore, please be as honest and as specific as you can in answering the following questions. Your comments will in turn, help design future workshops. Thank you!

INSTRUCTIONS: Listed below are the titles of each session presentation. In the space provided, indicate to what extent the information was utilized or implemented into your classroom.

Information gained from the workshop was utilized or implemented in your classroom:

- A. Immediately at the beginning of the school year.
- B. Later on in the school year.
- C. Within the next school year.
- D. At some future date, though I can foresee no immediate use for them.
- E. Never.

PRESENTATIONS:

Monday

- | | A | B | C | D | E |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Writing Performance Objectives | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2. The Learner and Learning | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3. The Learner with Special Needs | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4. The Role and Responsibilities of the Health Occupations Education Teacher | ☐ | ☐ | ☐ | ☐ | ☐ |
| 5. Selecting Clinical Learning Experiences | ☐ | ☐ | ☐ | ☐ | ☐ |

Tuesday

- | | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Teaching - The Four Step Method | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2. History and Philosophy of Vocational Education | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3. Designing Lesson Plans | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4. Lesson Plan Preparation | ☐ | ☐ | ☐ | ☐ | ☐ |

Wednesday

- | | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. The Instructor's Role in Laboratory Organization and Management | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2. Micro Teaching | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3. Laboratory Safety | ☐ | ☐ | ☐ | ☐ | ☐ |

PRESENTATIONS (Continued):Thursday and Friday

1. Instructional Media and Materials
2. Individualized Instruction
3. Evaluation

A	B	C	D	E
☐	☐	☐	☐	☐
☐	☐	☐	☐	☐

Friday

1. Vocational Student Activities
2. Certification

A	B	C	D	E
☐	☐	☐	☐	☐
☐	☐	☐	☐	☐

Check each statement below which expressed your feelings about the workshop.
In some cases, you may wish to check more than one answer per question.

1. Overall, the workshop was:

- ☐ Very worthwhile in terms of answering my immediate needs.
- ☐ A worthwhile experience, though some of my immediate needs were not met.
- ☐ Of limited value.
- ☐ Comments: _____
- _____
- _____

2. The amount of time spent on lecture:

- ☐ Was too extensive.
- ☐ Was about right for the material presented.
- ☐ Was inadequate for the kind of materials presented.
- ☐ Could better have been spent on other activities
- ☐ Comments: _____
- _____
- _____

3. Small group meetings:

- ☐ Were effectively incorporated into the workshop.
- ☐ Should have been included, but were not.
- ☐ Were not necessary and were not included.
- ☐ Added nothing to workshop effectiveness and should have been omitted.
- ☐ Comments: _____
- _____
- _____

4. Audiovisual presentations:

- ☐ Were used with great effectiveness.
- ☐ Were not as effectively used as they might have been.
- ☐ Were not used, but would have been helpful.
- ☐ Were not necessary for this workshop and were not used.
- ☐ Were relied upon too heavily.
- ☐ Comments: _____
- _____
- _____

5. Opportunity for discussion:

- ☐ Was adequate and greatly helped the group's understanding of topics presented.
- ☐ Was limited, but adequate for purposes.
- ☐ Was inadequate.
- ☐ Comments: _____
- _____
- _____

6. On the whole, this workshop was:

- ☐ More effective than others I've attended.
- ☐ Similar to others of its type I've attended.
- ☐ Not as effective as others.
- ☐ This is the first workshop of this type I've attended.
- ☐ Comments: _____
- _____
- _____

7. As a participant, I felt:

- ☐ Very welcome to ask questions or seek additional help at any time.
☐ Welcome to ask questions when they were asked for.
☐ Somewhat uneasy about asking questions.
☐ Comments: _____

8. I intend to implement methods or materials introduced in this workshop

- ☐ Immediately.
☐ Within the next year.
☐ At some future date, though I can foresee no immediate use for them.
☐ Never.
☐ Comments: _____

Briefly answer the following questions. Please be as specific so that your answers will help us design future workshops.

1. What part of the Program was of most value to you as a Health Occupations educator?

2. What part of the Program was of least value to you?

3. What topics would you like offered at the next workshop?

4. What would you consider the single most important concept gained from this workshop?

5. Please describe your overall reaction to the workshop. (Was it what you expected, useful, suggestions for improvement!)

Evaluation in Health Occupations Education
Industrial Education 498Fv

The Pennsylvania State University
Division of Occupational and Vocational Studies
119 Rackley Building
University Park, PA 16802

Your evaluation of our services helps us design future workshop training which is effective and relevant to your needs. Therefore, please be as honest and as specific as you can in answering the following questions. Your comments will in turn, help design future workshops. Thank you!

INSTRUCTIONS: Listed below are the concepts covered in the workshop on evaluation. In the space provided, indicate to what extent the information was utilized or implemented into your classroom.

Information gained from the workshop was utilized or implemented in your classroom:

- A. Immediately at the beginning of the school year.
- B. Later on in the school year.
- C. Within the next school year.
- D. At some future date, though I can foresee no immediate use for them.
- E. Never.

CONCEPTS

I. Instructional Accountability	A	B	C	D	E
A. Evaluation vs accountability	☐	☐	☐	☐	☐
B. Relationship of behavioral objectives to accountability	☐	☐	☐	☐	☐
C. Influence of behavioral objectives on the teaching-learning process	☐	☐	☐	☐	☐
D. Influence of behavioral objectives on the evaluation process	☐	☐	☐	☐	☐
II. Development of Behavioral Objectives					
A. Components of a behavioral objective	☐	☐	☐	☐	☐
B. Specific behavioral objectives	☐	☐	☐	☐	☐
C. General behavioral objectives	☐	☐	☐	☐	☐
D. Points in writing behavioral objectives	☐	☐	☐	☐	☐
III. Preassessment					
A. Preassessment of entry behavior	☐	☐	☐	☐	☐
B. Preassessment of terminal behavior	☐	☐	☐	☐	☐
C. Prescribing specific instructional activities	☐	☐	☐	☐	☐

CONCEPTS (Continued)

IV. Objectives and the behavioral domain	A	B	C	D	E
A. Cognitive	☐	☐	☐	☐	☐
B. Affective	☐	☐	☐	☐	☐
C. Psychomotor	☐	☐	☐	☐	☐
V. Evaluation					
A. Norm-referenced	☐	☐	☐	☐	☐
B. Criterion-referenced evaluation	☐	☐	☐	☐	☐
C. Implementing a criterion-referenced evaluation system	☐	☐	☐	☐	☐
D. Differences between the grading and the evaluation process	☐	☐	☐	☐	☐
VI. Methods of evaluating attainment of behavioral objectives					
A. Paper and pencil test items	☐	☐	☐	☐	☐
B. Problem solving evaluation	☐	☐	☐	☐	☐
C. Group project	☐	☐	☐	☐	☐
VII. Methods of evaluating attainment of clinical behavioral objectives					
A. Meaning of clinical practice	☐	☐	☐	☐	☐
B. Observation methods	☐	☐	☐	☐	☐
C. Written communication methods	☐	☐	☐	☐	☐
D. Oral communication methods	☐	☐	☐	☐	☐
VIII. Individual project					
A. Analyze research	☐	☐	☐	☐	☐
B. Application	☐	☐	☐	☐	☐

Check each statement below which expressed your feelings about the workshop.
In some cases, you may wish to check more than one answer per question.

1. Overall, the workshop was:	2. The amount of time spent on lecture:
___ Very worthwhile in terms of answering my immediate needs.	___ Was too extensive.
___ A worthwhile experience, though some of my immediate needs were not met.	___ Was about right for the material presented.
___ Of limited value.	___ Was inadequate for the kind of materials presented.
___ Comments: _____	___ Could better have been spent on other activities.
_____	___ Comments: _____
_____	_____

3. Small group meetings:

- ☐ Were effectively incorporated into the workshop.
☐ Should have been included, but were not.
☐ Were not necessary and were not included.
☐ Added nothing to workshop effectiveness and should have been omitted.
☐ Comments: _____

5. Opportunity for discussion:

- ☐ Was adequate and greatly helped the group's understanding of topics presented.
☐ Was limited, but adequate for purposes.
☐ Was inadequate.
☐ Comments: _____

7. As a participant, I felt:

- ☐ Very welcome to ask questions or seek additional help at any time.
☐ Welcome to ask questions when they were asked for.
☐ Somewhat uneasy about asking questions.
☐ Comments: _____

4. Audiovisual presentations:

- ☐ Were used with great effectiveness.
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☐ Similar to others of its type I've attended.
☐ Not as effective as others.
☐ This is the first workshop of this type I've attended.
☐ Comments: _____

8. I intend to implement methods or materials introduced in this workshop.

- ☐ Immediately.
☐ Within the next year.
☐ At some future date, though I can foresee no immediate use for them.
☐ Never.
☐ Comments: _____

Briefly answer the following questions. Please be as specific so that your answers will help us design future workshops.

1. What part of the Program was of most value to you as a Health Occupations educator?

2. What part of the Program was of least value to you?

3. What topics would you like offered at the next workshop?

4. What would you consider the single most important concept gained from this workshop?

5. Please describe your overall reaction to the workshop. (Was it what you expected, useful, suggestions for improvement!)
